HP NetServer E 800
Service Manual

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Audience Assumptions

This guide is for the person who services LAN servers. Hewlett-Packard Company assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

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1 General Information

Notice to Service Technicians

This is the service document for the HP NetServer E 800. You may also need to access the HP NetServer E 800 Installation Guide or the HP NetServer E 800 User Guide that are available on the Network Server Division WEB site:

http://www.hp.com/netserver/

The HP NetServer E 800 Installation Guide contains additional information on the installation process, which the end users follow. Both documents are needed for complete servicing information.

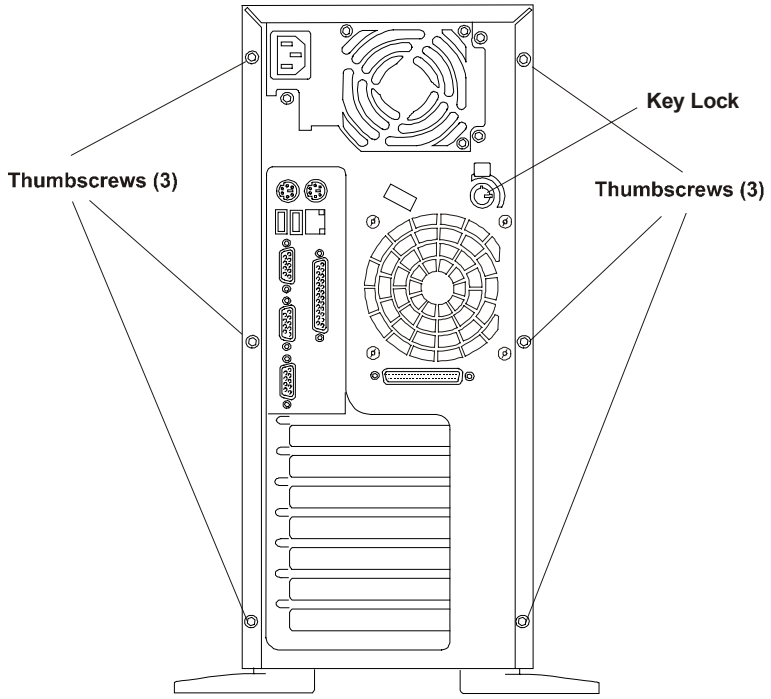
WARNING	Before removing the cover, always disconnect the power cord and unplug telephone cables. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist-strap contacts your skin.

Removing the Cover

To remove the cover, follow these steps:

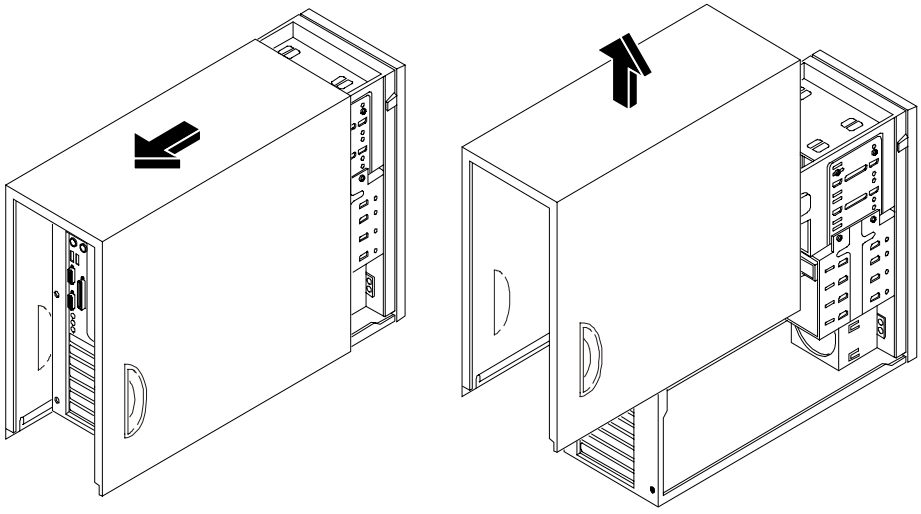
NOTE	These steps do not include the removal of the front bezel of the NetServer. You ***do not*** need to remove the front bezel of the HP NetServer E 800 to install internal accessories, such as memory or mass storage.

1. Turn off the NetServer and disconnect the power cord and any phone line.
2. Unlock the cover: use the key in the key bag located on the rear of the NetServer. The locking mechanism is at the rear.
3. Remove six (6) Torx T-15/slotted thumbscrews.



Thumbscrews and Lock Holding on Cover

4. Remove the HP NetServer cover.
   a. Place both hands into the slot handles at the rear of the cover.
   b. Pull the cover back to release it from the front flange and then lift the cover up and away from the chassis.
5. If you are installing accessories or servicing the NetServer, move the feet inward before turning the NetServer onto its right side.

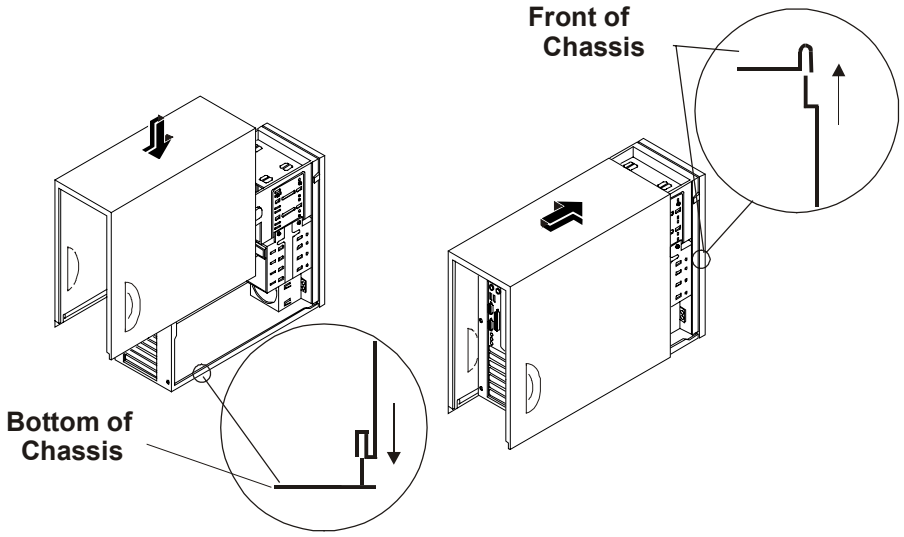


Removing the Cover

Replacing the Cover

To replace the cover, follow these steps:

1. If you have been installing accessories or servicing the NetServer, return the feet to the normal position, before turning the NetServer upright. Refer to "Adjusting the NetServer Feet."
2. If necessary, return the air duct to its closed position.
3. Place a hand on each side of the cover at the bottom edge and press inward while lowering the cover onto the chassis. The cover has flanges that rest on the rails inside the chassis.

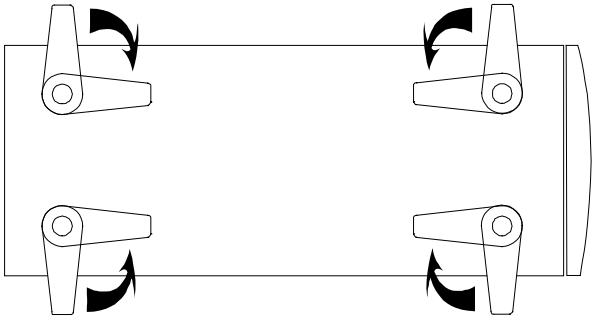


Replacing the Cover

4. Push the cover forward until it is seated within the slot at the front of the chassis.
5. Replace the six T-15/slotted thumbscrews in the rear.
6. Re-lock the cover with the key lock at the rear of the NetServer.

Adjusting the HP NetServer Feet

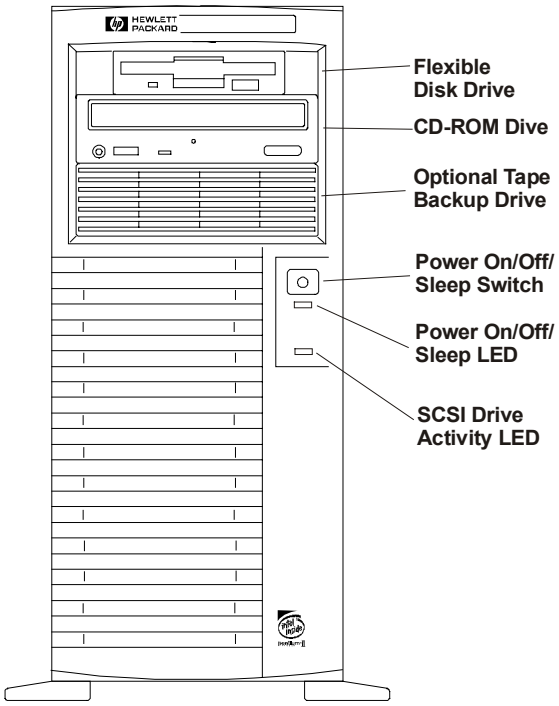
The stabilizing feet are used to steady the HP NetServer during normal operation and must be turned outward. When adding internal accessories to the NetServer, turn the feet inward so that the NetServer will lie flat on its side.



Turn Feet Inward before Laying the NetServer on Its Side

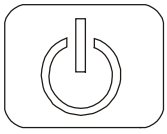
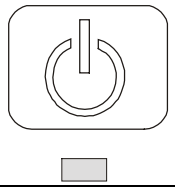
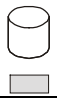
Front Panel Control and Indicators

The HP NetServer E 800's switches, indicators, and the user-serviceable internal components of the NetServer are shown in the following illustrations.



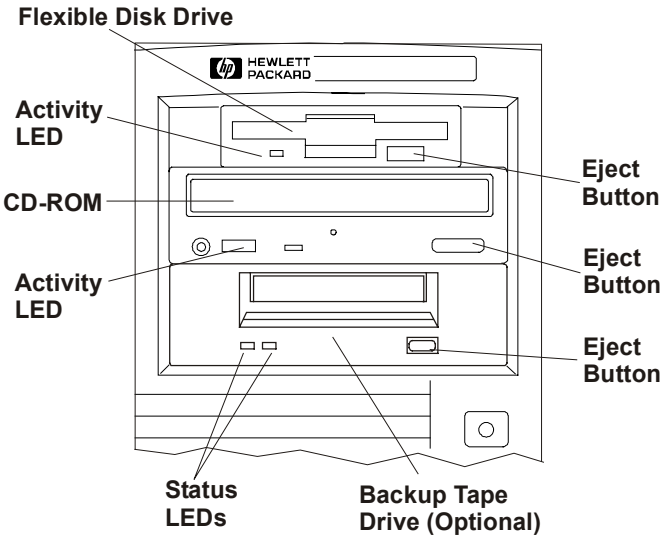
NetServer – Front View

Front Panel Switch and Indicators

Control / Indicator	Description
Power On/Off/Sleep Switch 	This button turns the HP NetServer power On or Off, and if available, also transitions the NetServer between Power On and sleep states. If sleep states are not available, then this button only turns power On or Off. The sleep states are NOS dependent and not available if your NOS does not support power management based on the ACPI (Advanced Configuration and Power Interface) standard. Refer to "Sleep States (ACPI)" later in this chapter.
On/Off/Sleep LED 	This green LED, located below the switch, indicates the power state of the NetServer: **Steady** green when the NetServer is operating normally **Off** when the NetServer is powered off. **Blinking** green at 1-Hz rate indicates the NetServer is in a sleep state and under ACPI control.
Drive Active LED 	This yellow LED flashes during internal SCSI drive activity.

Additional Front Panel Controls and Indicators

Storage devices provide additional controls and indicators, which give control and operational status. See the following table for Backup Tape drive LED Codes.



Storage Devices - Controls and Indicators

Backup Tape Drive LED Codes

Left LED	Right LED	Definition
Off	Off	No Power
On	Off	Cartridge Loaded, but No activity
Flashing*	Off	Cartridge Loaded and Active
Pulsing**	Off	Loading/Unloading/Ejecting/Power-On
Off	On	Self Test Fail
Off	Pulsing**	No Cartridge, but Caution (cleaning required)
On	Pulsing**	Cartridge Loaded, but Caution (cleaning required)
Flashing*	Pulsing**	Cartridge Loaded, Drive Active, Caution (cleaning required)
Pulsing**	Pulsing**	Cartridge Loading/Unloading, Caution (cleaning required)

* Flashing at 4 Hz rate

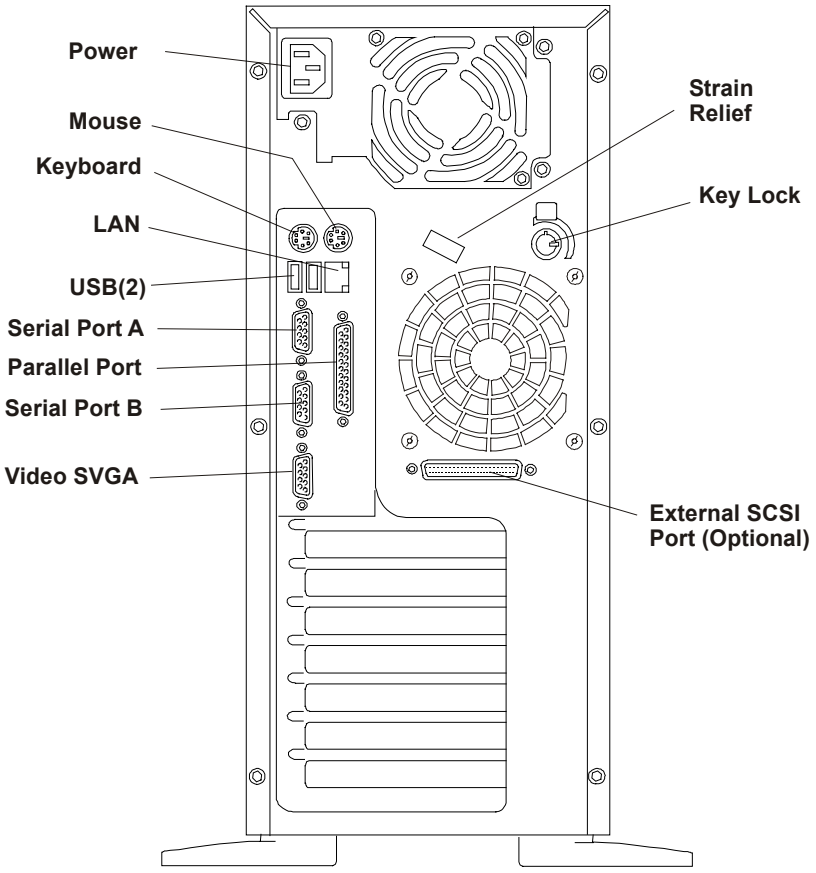
** Pulsing at 2 Hz rate

NOTE For more information on the HP Tape Drive and its error codes, refer to the documentation provided with the tape drive or refer to Hewlett-Packard's web site, at:

http://www.hp.com/netserver/

The ports and connectors on the NetServer's rear panel are shown in the following illustration.

- The Power Connector accepts a standard power cable to connect the HP NetServer E 800 with the site power supply.
- The Mouse Port accepts a standard mouse with a PS/2 connector.
- The Keyboard Port accepts a standard keyboard with a PS/2 connector.
- The LAN port is included as an embedded controller based on the Intel 82559 10/100 Base T Fast Ethernet PCI board. It has a RJ-45 LAN connector and two LEDs to indicate LAN speed and valid connection.
- Two USB ports are provided for printers, scanners, and external modems.
- The Serial Port A is a standard serial connector.
- The Parallel Port is a standard parallel connector, which supports Extended Capabilities Port (ECP) / Enhanced Parallel Port (EPP).
- The Serial Port B is a standard serial connector.
- A Video SVGA Port provides the video output and its specifications are listed in Chapter 2.
- The external SCSI connector is provided by the optional HP NetServer E 800 Internal/External SCSI Cable Kit (P/N P1774A).



NetServer – Rear View

Powering-Up the HP NetServer

NOTE	Turn on power to the monitor connected to the E 800 before you power-on the E 800. This allows proper auto-configuration of video output of the E 800 as it boots up.

1. Ensure the HP NetServer's power cord is connected to the power source.
2. Press the Power button on the front control panel.

When you press the power button on the control panel, the NetServer powers up and loads the operating system. The NetServer runs a set of Power On Self-Tests (POST) during this process. For details refer to Chapter 4, "Diagnostics."

Powering-Down the HP NetServer

1. Log off all users and if necessary, back-up files.

◊ Schedule the power down for a time when the fewest users will be affected by the NetServer's downtime.

◊ If you will be doing any kind of hardware or software upgrade, be sure your NetServer's data has been backed up.

◊ Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.

2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.

   Normally this completes the power down procedure.

NOTE	The power supply will continue to provide standby current to the NetServer until the power cable is disconnected from the rear panel.

Multiple-Server Configurations

The HP NetServer temporarily draws a large "inrush current," when first connected to an AC power source. This also occurs when the NetServer is in a standby mode (power is turned off and the power cord is plugged into AC power). The inrush current is much greater than the NetServer's normal operating current and generally, the AC power source can handle the normal inrush current.

However, if you install several HP NetServers on one circuit, precautions are necessary. If there is a power failure and power is then restored, all the servers immediately begin to draw inrush current at the same time. If the circuit breakers on the incoming power line have insufficient capability, the breaker may trip and thus prevent the servers from powering up.

When preparing your site for installation, allow for the additional inrush current. See "Power Specifications" in Chapter 2.

Sleep States (ACPI)

The HP NetServer supports the ACPI (Advanced Configuration and Power Interface) standard, which is a key component of a NOS's directed power management. The supported features are only available when an ACPI-compliant NOS is installed on the NetServer. The term “sleep state” refers to any of several reduced power consumption states in which normal NOS activity has ceased.

The NetServer supports several sleep states, including a sleep state with a short wake-up time, sometimes referred to as “standby” or “suspend” by various operating systems. In this sleep state the NetServer appears to be off, and is indicated by no display on the monitor and no activity for the CD-ROM or internal hard drives. However, the power LED is slowly flashing and the fans are operating.

An additional sleep state supported by the NetServer is one with a slower wake-up time, sometimes referred to as “hibernate” by various operating systems. In this sleep state, the NetServer appears to be off as mentioned earlier, but the fans and the power LED are also turned off. This sleep state's unique feature (and the reason for its slower wake-up time) is that the NetServer's state (applications running, screens open, etc.) just prior to hibernate has been saved to disk and must be restored from disk upon wake-up. However, this method of restoring the NetServer's operation is much faster than a complete rebooting of the NetServer. This method still requires running all the start-up self-tests before starting the NOS, but loading the NOS and all the previously opened applications is much faster.

The NetServer supports certain types of system activity, which are used as wake-up events from sleep states. These wake-up events can be generated from the power button, LAN activity, and scheduled events.

NOTE	The HP NetServer’s power management policies (transitions between various power states) and the user options are specific to the particular ACPI-compliant NOS installed on the NetServer. If your respective NOS is ACPI-compliant, refer to the power management features in the instructions provided for more information.

The HP NetServer’s power button can be configured to initiate a sleep state (Sleep button) or a “soft off” or graceful shutdown of the NOS, rather than an immediate shutdown of the power supply. The power button configurations are dependent on the user interface provided by the ACPI-compliant NOS. While power management is under the control of the ACPI-compliant NOS, the HP NetServer’s power button is capable of an override in case of a non-responsive NOS.

NOTE	The HP NetServer power button will force a power down without waiting for the NOS to gracefully shut down the NetServer when the power button is pressed and held in excess of four seconds.

CAUTION	If the power button override is used; there is a strong possibility of corrupted or lost data

2 System Information

Introduction

This chapter provides information on mass storage, connector pin-outs, accessory guidelines and system specifications.

Mass Storage

The HP NetServer E 800 comes standard with an IDE CD-ROM and a flexible disk drive with some configuration of SCSI hard disk drives. The internal mass storage cage can hold up to 5 additional SCSI drives (including a tape back up drive).

Mass Storage Guidelines

- General Guidelines
  - ◊ Use care when unpacking and handling the SCSI disk drives.

    The hard disk drives are very susceptible to mechanical shock and can be easily damaged by a drop as short as one-quarter of an inch. If the drop would crack an egg, it will damage the drive.
  - ◊ Do not stack drives.
  - ◊ The NetServer is internally limited to 7 mass storage shelves.

    The flexible disk drive and CD-ROM drive, which are standard on all models of the HP NetServer E 800, occupy shelves 1 and 2 respectively.
  - ◊ If a backup tape drive is used it will occupy shelf 3.
  - ◊ Shelves 4, 5, 6, and 7 are available for SCSI hard drives and one is required for the boot drive.
- IDE Devices
  - ◊ The embedded IDE controller is an Enhanced-IDE dual channel controller and provides two connectors (IDE-1 and IDE-2) for IDE devices.
  - ◊ The IDE CD-ROM uses only one connector on the cable from the primary channel (IDE-1) connector.
  - ◊ A secondary IDE connector (IDE-2) is available, but is not supported by Hewlett-Packard.
- SCSI Device Selection
  - ◊ Use only low-voltage differential (LVD) SCSI devices.
  - ◊ Do not use high voltage differential (HVD) SCSI devices on either of the SCSI channels or damage will occur.
  - ◊ Ensure the SCSI devices you install do not have terminations. The SCSI drives are connected to a terminated cable and don't require termination on the SCSI drive.
  - ◊ Use only HP LVD SCSI 1-inch low-profile 3.5-inch hard disk drives for the removable hard disk drive cage.

- The embedded dual-channel Ultra-2 SCSI controller includes connectors for SCSI channels A and B.
- Channel A is typically used for cabling the factory-installed hard disk drive(s), which may consist of five SCSI drives (including an optional tape drive). The standard SCSI cable has five, 68-pin, high-density connectors for the SCSI devices and has a terminator on the end of the cable.
- The optional HP supplied tape drive comes with a 50-to-68-pin adapter to connect to the SCSI connector on the cable used to connect the tape drive.
- Channel B may be used in a duplexing arrangement or to control an external mass storage solution. At least two SCSI hard disk drives are required if the duplexing option is used.

  Channel B may also be used to connect the optional tape drive, if the lesser speed of the tape drive slows down disk access time of the Ultra-2 SCSI drives.

  An additional cable kit is required for duplexing, external mass storage solutions, or connecting the optional tape backup drive.

Boot Priority

The NetServer's boot order should be considered when selecting a PCI slot on the system board. This is especially important if you are installing a board that requires a lower number in the boot order. The board's boot priority is set by its slot location in the boot order.

By default the NetServer searches for boot devices in this order:

1. IDE CD-ROM drive
2. Flexible disk drive
3. Embedded SCSI A (typically the SCSI Drives)
4. Embedded SCSI B (typically the external SCSI Devices)
5. PCI slot 1
6. PCI slot 2
7. PCI slot 3
8. PCI slot 4
9. PCI slot 5
10. PCI slot 6
11. PCI slot 7

The embedded SCSI controller consists of two channels, A and B. Channel A is typically used to control the SCSI hard drives (4) and optional tape back up drive. Channel B is typically used to control the external SCSI devices. On each SCSI channel, the controller scans for a boot device starting at device ID 0 and works through the ID numbers. The NetServer's embedded controller is always SCSI ID 7. If an optional SCSI backup tape drive is used it would take address ID 4.

NOTE	The boot order can be changed using the NetServer's (BIOS) Setup Utility and the SCSI Select Utility.

Mass Storage Devices

Interface	Max Number of Devices	Installed Devices and Addresses
Flexible disk drive	1	Factory installed flexible disk drive in (top) shelf 1.
IDE-1	2*	Factory installed CD-ROM drive in shelf 2 (Primary IDE connector)
Ultra SCSI Adapter	1** (optional)	Optional SCSI Tape Backup Drive in shelf 3 (address = ID 2)
Ultra-2 SCSI Channel A	up to 4***	• Factory installed SCSI hard drive in shelf 4 (address = ID 0) • Up to three additional SCSI hard disk drives in shelves 5, 6, and 7 of the removable mass storage cage. • Optional duplexing of at least two SCSI drives in shelves 4, 5, 6, and 7. • Embedded SCSI controller (address = ID 7)
Ultra-2 SCSI Channel B	up to 15***	• Optional hardware mirroring of up to two SCSI drives in shelves 4, 5, 6, and 7. • Optional control of up to 15 external SCSI devices

* The primary IDE (IDE-1) cable is connected to the factory-installed CD-ROM drive. A secondary IDE connector (IDE-2) is available, but is not supported by Hewlett-Packard.

** A 50 to 68 pin SCSI adapter is provided with the HP Tape Drive.

*** Both SCSI channels (A and B) can each support up to 7 devices; however, there are only enough internal storage shelves for four hard drives and one optional tape backup device, which is typically connected to Channel A. Channel B is typically used to control external SCSI devices. If you decide to duplex internal drives using Channel B, you are restricted to the internal drives only.

Duplexing Hard Drives

You may choose to duplex the drives in the HP NetServer's removable hard disk drive cage (only four drives possible). The NetServer supports an option to duplex the drives using the embedded dual channel SCSI controllers (SCSI A and B). There must be at least two SCSI drives available in the hard disk drive cage to duplex the drives. The NetServer also supports HP's NetRAID 1Si PCI Controller board to control the two duplexed channels.

CAUTION	To prevent damage to the embedded SCSI controller, don't use a HVD (High Voltage Differential) device.

External SCSI Connector

The HP NetServer E 800 can be configured to extend one of its SCSI channels (typically channel B) to an external SCSI connector. This allows connection of additional mass storage devices to the second channel of the NetServer's embedded controller. It requires a second SCSI cable, HP NetServer E 800 Internal/External SCSI Cable Kit (P/N P1774A).

Memory Guidelines

- The HP NetServer E 800 only uses 133 MHz (PC133) SDRAM DIMMs, which are electrically different from the EDO and PC100 SDRAM memory modules used in previous HP NetServer models.
- DIMMs sizes supported are 128 MB, 256 MB, or 512 MB buffered in any combination.
- Supported memory capacity ranges from 128 MB to 2 GB maximum (512 MB per DIMM slot x 4 DIMM slots total). The minimum capacity is 128 MB (one DIMM).
- DIMM sizes may be mixed on the system board and may be loaded in any order (0 through 3).

  However, HP recommends starting at slot 0 and filling the slots in order: 0, 1, 2, and 3.
- Empty slots between DIMMs are permitted.
- When handling DIMMs, observe anti-static precautions to avoid damage.

To ensure you have the correct DIMMs before installation, refer to one of the following for a list of qualified DIMMs:

- HP Order Assistant on the HP web site at:

  http://www.hp.com/go/netserver
- HP Customer Service

Four MB of video memory is provided on the system board and cannot be upgraded.

Accessory Board Guidelines

The system board in the HP NetServer E 800 provides up to seven PCI slots (P1 through P7), five 32-bits lots and two 64-bit slots.

Tested PCI Boards

For a list of tested PCI boards, check for compatibility under the Hardware Tested Products list for the HP NetServer E 800 under the Service and Support topic for the specific NOS used in the NetServer at HP's web site:

http://netserver.hp.com/netserver/support/compatibility/compatibility.asp

CAUTION	Some accessory board outputs may exceed U.S. National Electrical code (NFPA 70) Class 2 or limited power source limits and must use appropriate inter-connecting cabling in accordance with the National Electrical Code. (All HP boards comply with Class 2.)

IRQ Settings

The IRQ settings are automatically assigned and don't require user intervention. The HP NetServer uses the Plug-and-Play feature of the PCI boards to correctly assign its resources automatically.

Using the Primary or Secondary PCI Bus

The E 800 has a Primary PCI bus and Secondary PCI bus supporting seven PCI accessory slots. The two busses are peer to peer which provides approximately equal performance except when using the two 64-bit slots versus the 32-bit slots.

PCI Slots	PCI Bus
Slots 1 through 4	Primary PCI Bus
Slots 5 through 7	Secondary PCI Bus

Technical Specifications

The specifications listed below vary if you install a mass storage device in your server that has more stringent environmental limits. Ensure the operating environment for your server is suitable for all of the mass storage devices being used.

Environment

Temperature

Operating	5° to 35° C (41° to 95° F)
Non-operating	-40° to +65° C (-40° to +149° F)

Humidity

Operating	20% to 80% relative humidity, non-condensing
Non-operating	5% to 95% relative humidity, non-condensing

Altitude

Operating	-30 to 3,000 m (~ 10,000 ft)
Non-operating	-30 to 12,000 m (~ 40,000 ft)

Thermal Output

Maximum Operating	1007 BTU/hr

Weight and Dimensions

Weight	Approx. 30 lbs. (14 kg.), depending on configuration – excludes keyboard and monitor.
Height	17.09 inches (434 mm)
Width	7.1 inches (180 mm) 11.67 inches (296.5 mm) Feet opened
Depth	19.57 inches (497 mm)

Hardware

Specification	Characteristics
Processors	Intel Pentium III (up to two processors), supported speeds: 667, 733, 800, and 866 MHz. 256 KB level 2 cache on processor.
Chipset	RCC LE chipset with 66/133 MHz bus speed support
Memory	Supports up to four SDRAM DIMMs for a maximum total of 2 GB. Supported DIMM types: 128MB, 256MB, or 512MB buffered. 72 bits wide, ECC single-bit correcting, multi-bit detecting.
Video	Embedded ATI Rage XL video chip with 4MB SDRAM. Supports up to 1600x1200, 65K colors. See “Video Display Modes”.
SCSI	Embedded Symbios Ultra-2 SCSI dual-channel controller; 80 MB/s transfer rate, two 68-pin connectors.
IDE	Embedded Enhanced-IDE dual-channel controller.
PCI Bus	32-bit, 33 MHz speed, with two 64-bit slots and five 32-bit slots.
LAN	Embedded Intel 82559 10/100 PCI Fast Ethernet Controller. Wake-on-LAN enabled/disabled via BIOS setup.
I/O	Two Serial ports; One bi-directional parallel port with ECP/EPP high-speed support; PS/2 style mouse and keyboard connectors; two USB ports
CD-ROM	Bundled CD-ROM drive; IDE interface; 40x speed.

Video Display Modes

Resolution	Max. Refresh Rate @ 256 Colors	Max. Refresh Rate @ 65K Colors	Max. Refresh Rate @ 16.7M Colors
640x480	200 Hz	200 Hz	200 Hz
800x600	200 Hz	200 Hz	160 Hz
1024x768	150 Hz	150 Hz	120 Hz
1152x864	120 Hz	120 Hz	85 Hz
1280x1024	100 Hz	100 Hz	85 Hz
1600x1200	76 Hz	76 Hz	Not available

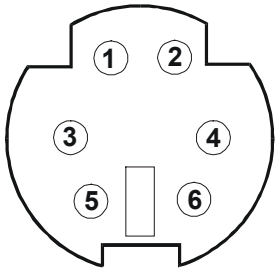
Power Supply Specifications

Parameter	Characteristics
Input Type	Auto-ranging
Input – Maximum Range	100 to 127 VAC 5.0 A at 50/60 Hz 200 to 240 VAC 2.8 A at 50/60 Hz
Operating Current	100 VAC 5.3 A 120 VAC 4.6 A 200/208 VAC 3.2 A 220/230 VAC 2.8 A
In-rush Current	25 A
Operating Power	256 W Continuous

Connector Pinouts

Unless otherwise noted, the following features apply to all models. Some features are factory installed; others are optional.

Mini-DIN (PS/2) Connectors

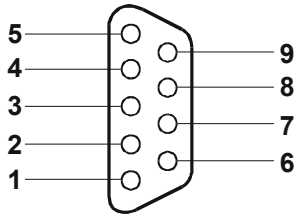


Mini-DIN Connector (female) for the Mouse and Keyboard

Mini-DIN Connector Pinouts for the Mouse and Keyboard

Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6	Not used

Serial Port Connector

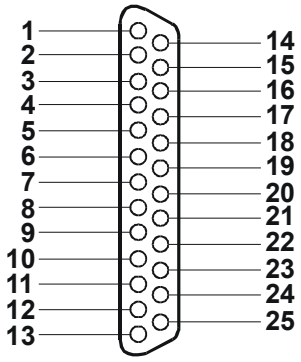


Serial Port Connector

Serial Port Connector (male) Pinouts

Pin Number	Signal Description
1	Data carrier detect
2	Receive data
3	Transmit data
4	Data term ready
5	Signal ground
6	Data set ready
7	Request to send
8	Clear to send
9	Ring indicator

Parallel Port Connector



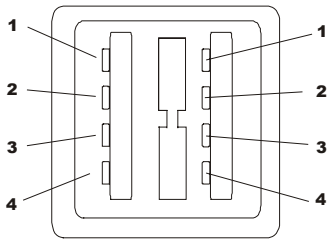
Parallel Connector

Parallel Port Connector (female) Pinouts

Pin Number	Signal Description	Pin Number	Signal Description
1	Strobe5	10	Acknowledge[b]
2	Data bit 06	11	Busy
3	Data bit 1[a]	12	Paper end
4	Data bit 2[a]	13	Select
5	Data bit 3[a]	14	Auto line feed[b]
6	Data bit 4[a]	15	Error1
7	Data bit 5[a]	16	Initialize printer[b]
8	Data bit 6[a]	17	Select in[b]
9	Data bit 7[a]	18-25	Signal ground

a. All data bits are sent to a printer in an 8-bit parallel format.
b. The signal is active low.

USB Connector



USB Connector

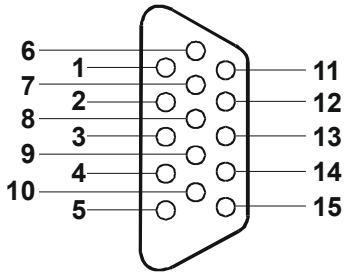
Universal Serial Bus Connector Pinouts

Pin Number	Signal Description
1	VBUS
2	D+
3	D-
4	GND

NOTE Use of the USB port is supported for printers, scanners, and external modems.

Video Connector – Accessory Board

The built-in video uses the standard 15-pin analog display pinout configuration. The pinouts for your monitor may vary. For the pinouts for your monitor, refer to the manual provided with your monitor.

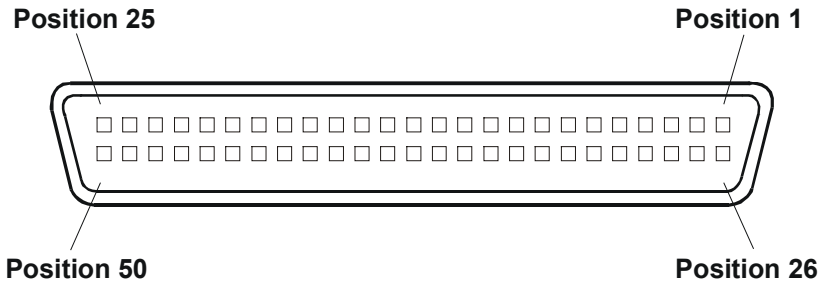


Video Connector

Video Connector (female) Pinouts

Pin Number	Function	Pin Number	Function
1	Red	9	Key (no pin)
2	Green	10	Sync return (ground)
3	Blue	11	Monitor ID bit 0
4	Monitor ID bit 2	12	Monitor ID bit 1
5	Monitor self test (ground)	13	Horizontal sync (+)
6	Red return (ground)	14	Vertical sync (-)
7	Green return (ground)	15	Not used
8	Blue return (ground)		

50-Pin Narrow SCSI Port Connector – Accessory Board

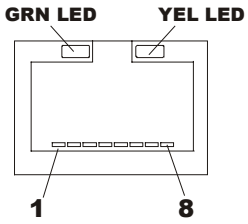


SCSI Port Connector

50-Pin Narrow SCSI Port Connector Pinouts

Pin Number	Signal Description	Pin Number	Signal Description
1-11	Ground	37	Reserved
12	Reserved	38	Termpwr
13	Open	39	Reserved
14	Reserved	40	Ground
15-25	Ground	41	-ATN
26	-DB(0)	42	Ground
27	-DB(1)	43	-BSY
28	-DB(2)	44	-ACK
29	-DB(3)	45	-RST
30	-DB(4)	46	-MSG
31	-DB(5)	47	-SEL
32	-DB(6)	48	-C/D
33	-DB(7)	49	-REQ
34	-DB(P)	50	-I/O
35-36	Ground		

LAN Connector – Accessory Board



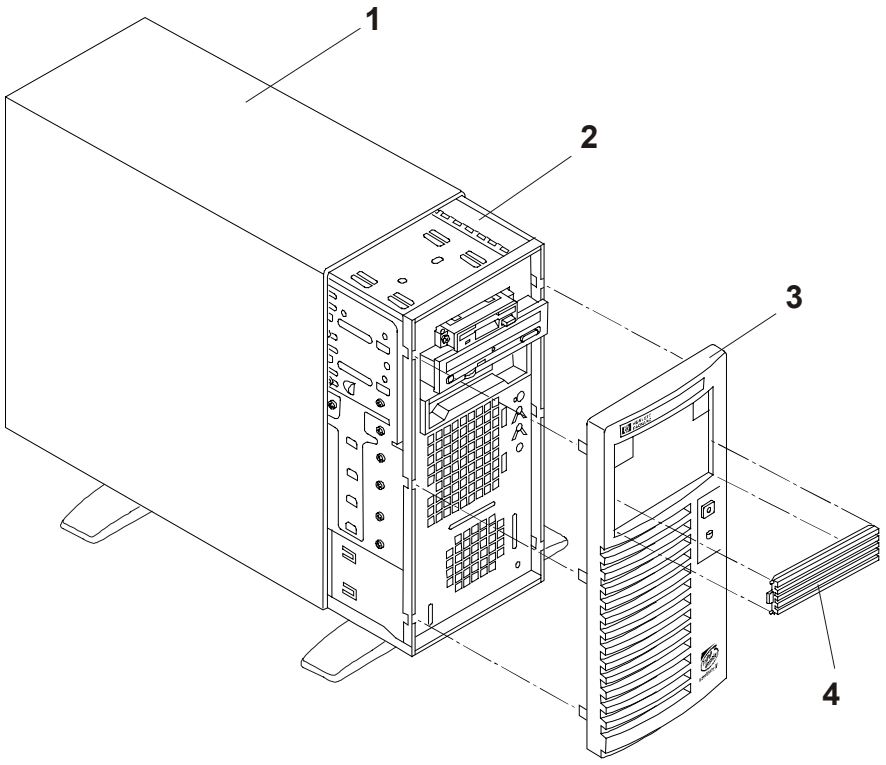
LAN Connector

LAN Connector Pinouts

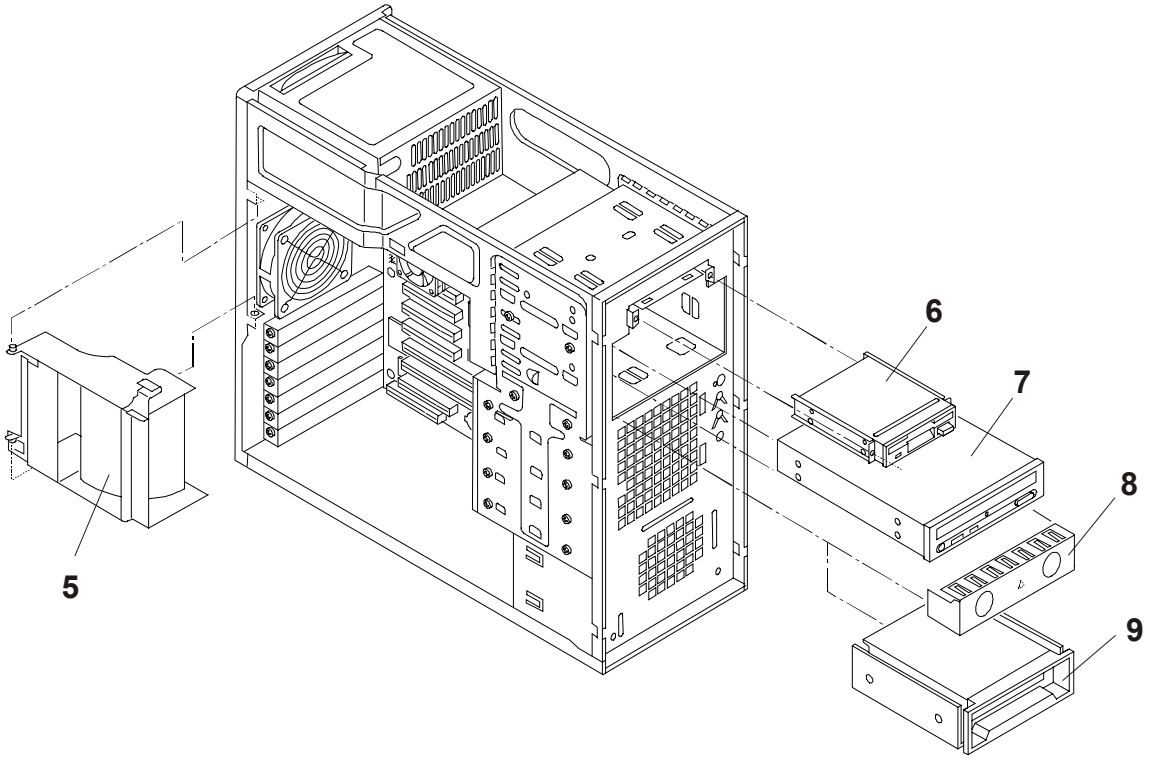
Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6-8	Not used

3 Parts Information

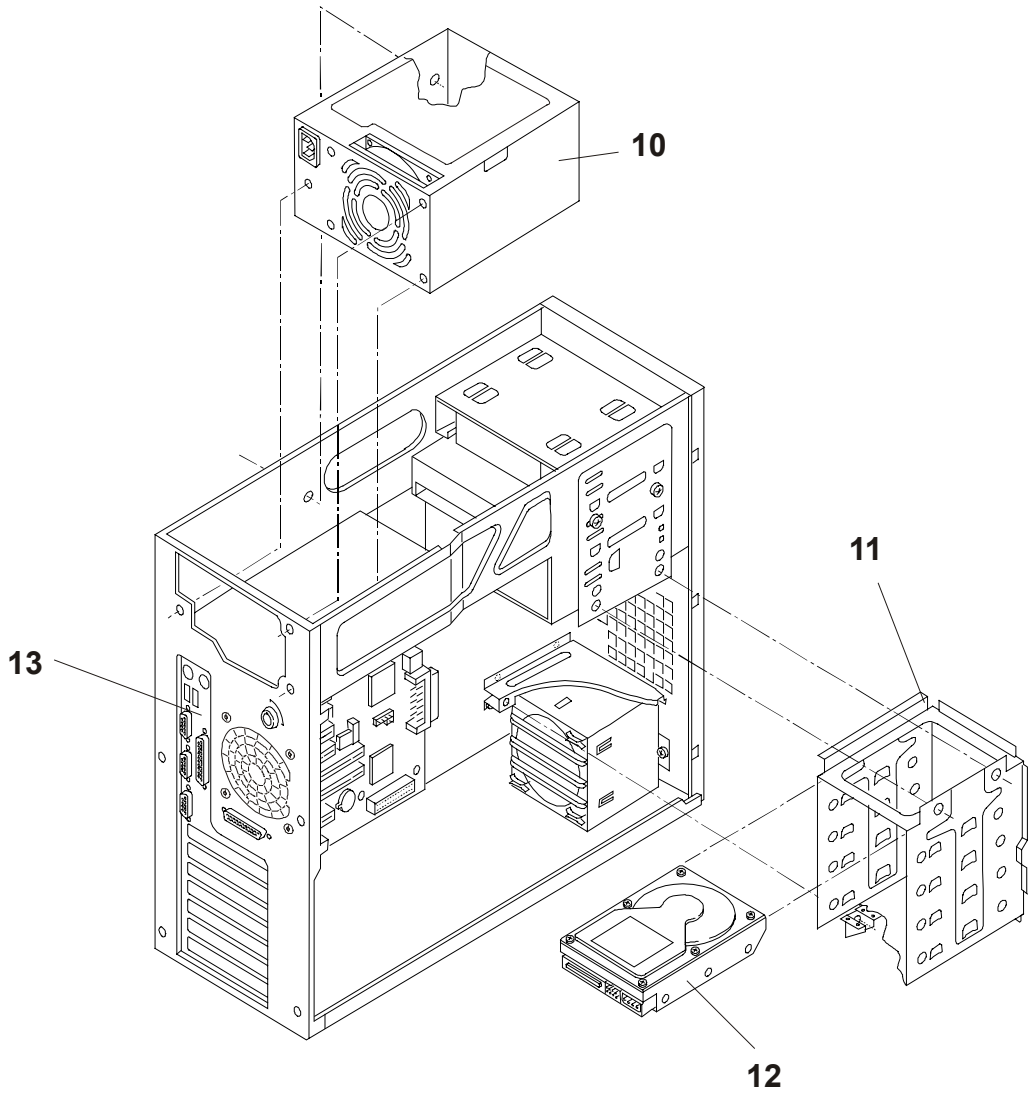
Exploded View – Cover and Bezel



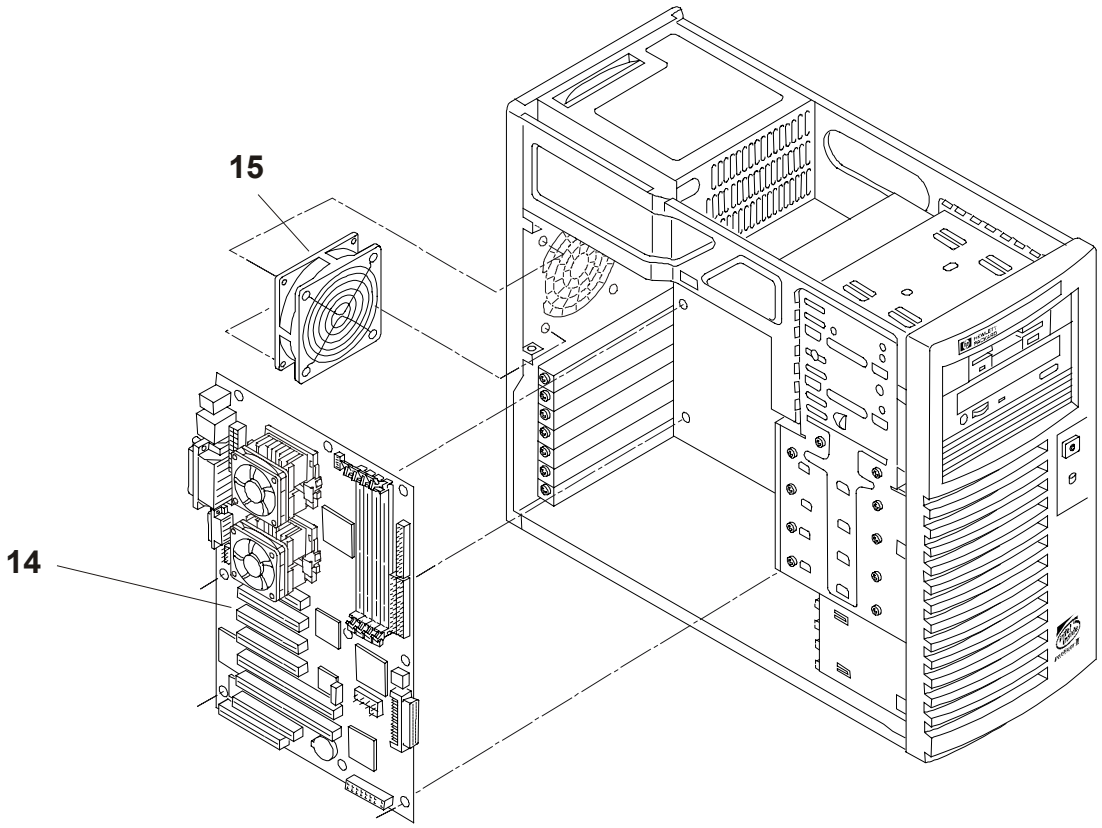
Exploded View – Drives (Shelf Mount)



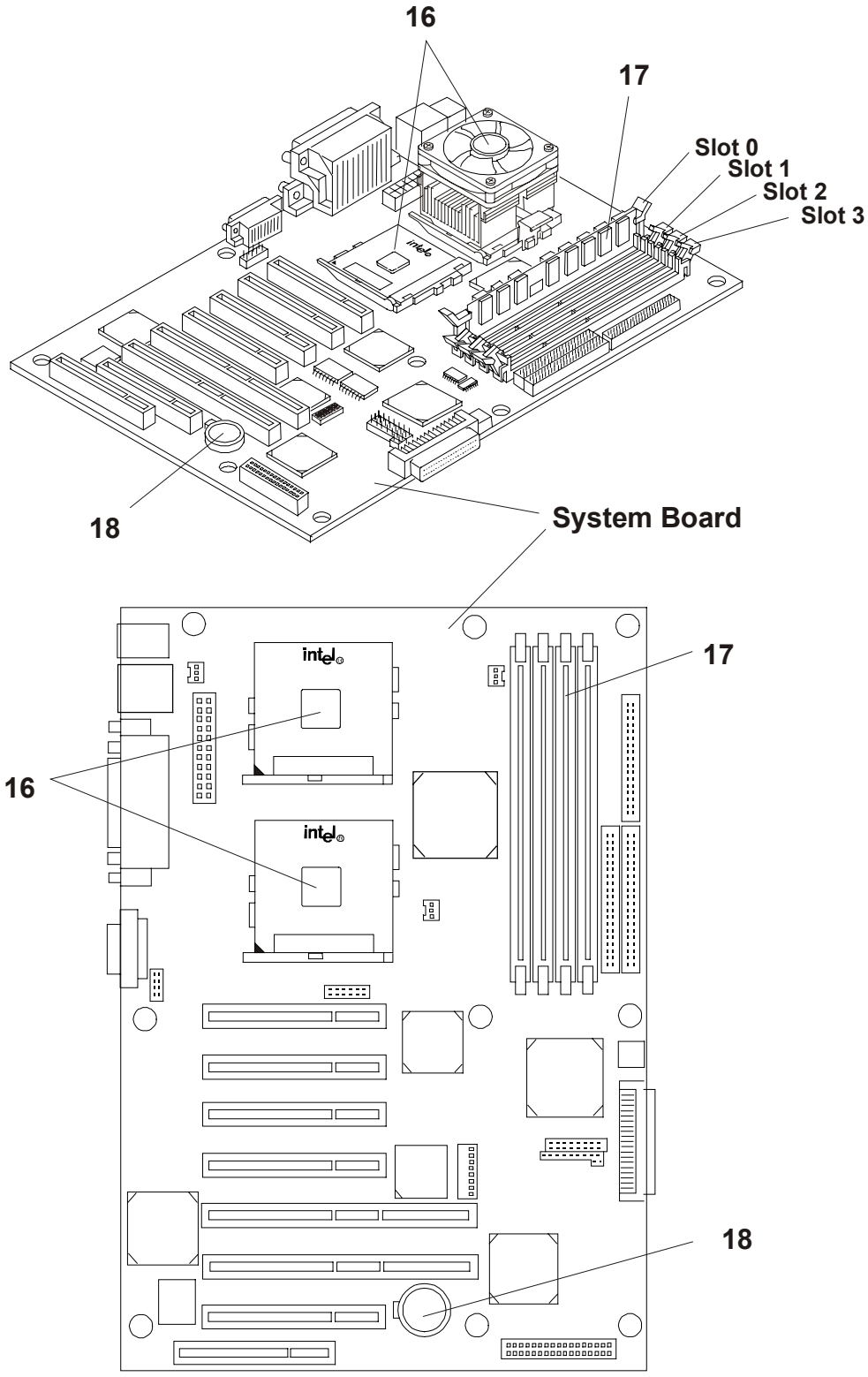
Exploded View – Power Supply and Drives (Cage Mount)



Exploded View – Exhaust Fan and System Board



Exploded View – System Board



Replaceable Parts List

The items in this list and the corresponding item numbers in the respective Exploded Views apply to both models of the HP NetServer, except where noted.

NOTE The part numbers listed below were available at the time of publication. Part numbers may change after publication. Order parts by the number listed below; HP's parts price list database will generally contain a reference to the revised part number. If a system board needs to be replaced, remove processor modules, DIMMs, or adapter boards and transfer these to the new board. Ensure all jumper and switch settings on the old board are transferred to the new board.

* This part is not on an exploded view

** This Part Number is revised with each new release

Item No.	Description	Replacement	Exchange
1	Cover	D9387-63012	
2	Chassis Assembly	D7140-63014	
3	Bezel	D7140-63003	
4	Drive Bay Cover	Not Orderable	
5	Air Flow Guide	D7140-63011	
6	3.5 inch flexible disk drive	D2035-60282	
7	CD-ROM Drive 40x	D9387-63003	D9387-69003
8	Spacer	Not Orderable	
9	Tape Drive, SureStore, DAT24I (Optional)	----------	C1555-69202
8	Spacer	Not Orderable	
10a	Power Supply, 256W, Fan Speed Control	D9387-63015	D9387-69015
10b	Power Supply, 256W, PFC (Japan)	D7140-63016	D7140-69016
11	Mass Storage Cage	Not Orderable	
12	9.1 GB Hard Disk Drive, Ultra 2 Wide	D4911-63001	D4911-69001
13	I/O Panel Assembly	D9387-63013	
14	System Board	D9387-63001	D9387-69001
15	Chassis Fan	D9387-63009	
16a	PIII/667 MHz, CPU and Heatsink/fan	P1768-63001	P1768-69001
16b	PIII/733 MHz, CPU and Heatsink/fan	P1769-63001	P1769-69001
16c	PIII/800 MHz, CPU and Heatsink/fan	P1770-63001	P1770-69001
16d	PIII/866 MHz, CPU and Heatsink/fan	P2464-63001	P2464-69001
16e	CPU Terminator	D9387-63016	
17a	DIMM, 128 MB	D8265-63001	D8265-69001

Item No.	Description	Replacement	Exchange
17b	DIMM, 256 MB	D8266-63001	D8266-69001
17c	DIMM, 512 MB	D8267-63001	D8267-69001
18	Battery, 3V lithium	1420-0356	
*	Foot	D7140-63004	
*	Nameplate, Bezel	D9387-63008	
**	HP Navigator CD-ROM	D9387-xxxx	
*	Technical Reference Card	D9387-63010	

Keyboards

Language	Part Number	Language	Part Number
US	D4950-63001	Danish	D4950-63016
Arabic/French	D4950-63025	French Canadian	D4950-63002
Portuguese	D4950-63027	German	D4950-63003
Cyrillic	D4950-63030	Spanish	D4950-63004
Belgian/Flemish	D4950-63014	French	D4950-63005
Italian	D4950-63017	Norwegian	D4950-63009
Arabic/English	D4950-63020	Swiss	D4950-63011
Korean/Hangu	D4950-63021	Swedish	D4950-63012
Taiwan	D4950-63023	UK	D4950-63013
Polish	D4950-63035	Czech	D4950-63036
Hungarian	D4950-63037	Greek	D4950-63032
Turkish	D4950-63035	Dutch	D4950-63006

Power Cords

Country	Part Number	Country	Part Number
Australia/New Zealand	8120-1369	India/South Africa	8120-4211
Canada/United States	8120-1751	Japan	8120-4753
Denmark	8120-2956	Switzerland	8120-2104
Europe	8120-1689	United Kingdom	8120-1351

Cables and Part Numbers

Cable	Description	Replacement Part Nos.
	Internal SCSI Cable w/connectors and termination	D9387-63005
	IDE CD-ROM Cable	D9387-63004
	Flexible Disk Cable	D7140-63006

Cable	Description	Replacement Part Nos.
	Internal/External SCSI Cable w/two connectors	D9387-63006
	Internal SCSI Cable w/three connectors and termination	D9387-63007

4 Diagnostics

Diagnostic Tests

When the server boots, a series of tests are displayed on the screen. The number of tests displayed depends on the configuration of the server. The following are the kinds of errors a user might get with the HP NetServer.

- Built-in diagnostic Error Messages.
- BIOS and other error messages. These are errors detected by the system BIOS outside the built-in diagnostics or application errors.

To see the Power On Self-Tests (POST):

- The HP NetServer must be functionally able to run the diagnostics.
- The video subsystem must be functional.
- The keyboard must be functional.

NOTE	BIOS ROM version number is displayed on the monitor screen during power-up.

Diagnostics Description

The diagnostics (Power-On Self-Test "POST") run automatically each time the NetServer is powered on. These diagnostics, which reside in the BIOS ROM, isolate server-related logic failures and indicate the board or component that needs to be replaced, as indicated by the Error Messages. Most NetServer hardware failures will be accurately isolated by the diagnostic

WARNING	You should always turn off the power and disconnect the power cord to the NetServer before attempting to remove the cover and touch the internal components. Failing to do so can expose you to electric shock and the server's components to damage. The power switch does NOT turn off standby power, so disconnect the power cord to turn off standby power.

HP NetServer DiagTools

The purpose of hardware diagnostic software is to provide tools for checking hardware problems. By design, diagnostic software executes simple tests of each hardware component. Usually, such tests assure that hardware is not the source of NetServer problems. This allows the user to eliminate hardware as the cause of the problem and to focus on operating system configuration parameters, network connections, and application software configuration parameters as the source of the problem.

If hardware problems are confirmed, the diagnostic software program can sometimes detect and diagnose the subsystem or specific NetServer component causing of the problem. In addition, diagnostic tools can capture information that allows support personnel to quickly assess the condition of the NetServer.

In order to be effective, diagnostic software tools must be used in the context of a wider troubleshooting procedure.

DiagTools Capabilities

DiagTools for HP NetServers is a set of off-line diagnostic tests, including tests for system and processor components, memory and storage elements, ports, and input/output devices. DiagTools is supplied on the *HP StartUp CD-ROM*.

The user prepares DiagTools software for use by transferring it to diskette. Then the DiagTools diskette is used to boot the server. A basic suite of tools checks key NetServer components, and a menu of advanced tests is available for in-depth testing.

DiagTools has the ability to test the following components:

- system board
- memory modules
- flexible disk drives
- parallel ports
- video monitor
- processors
- hard disk drives
- keyboards
- CD-ROM drives

DiagTools is an off-line diagnostic. Off-line diagnostics do not use the main operating system (OS) of the HP NetServer. The alternate DiagTools OS has far fewer features than the full-fledged OS. Thus, its capabilities are limited to a set of basic tests and a series of advanced tests. In addition, DiagTools does not use any tests, which might write over and thus destroy user data. Tests that require user inputs or decisions are left to the advanced series of tests.

You can use DiagTools to perform the tasks listed below:

- display a high-level inventory of the NetServer under test
- save and print a detailed inventory of hardware components
- conduct a basic test of components listed in the NetServer inventory
- display “PASSED” or “FAILED” overall results of basic tests
- record detailed test results of basic NetServer tests
- display a menu of advanced tests
- select and run one or a series of advanced tests
- add the record of results of advanced tests to the record of basic tests
- view a list to locate the meaning of a specific error code
- view one or more steps to help confirm and isolate error conditions
- browse the Support Ticket, which contains the detailed inventories and test results
- add comments to the Support Ticket

About Error Messages

A hexadecimal number designates each error message reported by DiagTools; a short note on the type of error; and a list of one or more steps the user can take in response. When you run a test, it exercises many aspects of the hardware, so the number of possible error messages exceeds 300. Most of these are encountered rarely, if ever.

Error codes can be viewed on line from the DiagTools User menu within the advanced series of tests, or you can refer to Chapter 3 of the *HP NetServer DiagTools Error Reference and User Guide*.

Advantages and Limitations of Hardware Diagnostics

Off-line diagnostic software is useful in making sure that hardware has been eliminated as the cause for possible NetServer problems. Such diagnostic tools can easily be shipped with a server, and they are relatively easy to use.

Only experienced personnel knowledgeable of its limitations should use off-line diagnostic software.

Some limitations are:

- booting the NetServer from the diagnostics diskette
- no access to operating system error logs, since the OS is not operating at the same time as the diagnostic tools
- limited ability to test only a single component at a time
- inability to indicate problems with wrongly configured NetServers or the network

Power-On Self Test (POST) Error Messages:

Error messages (POST Codes) are encountered if an error condition occurs during the boot process of the HP NetServer E 800. All codes and their respective descriptions are listed in the following table, and all the codes may not apply to your NetServer.

These codes will appear on the display monitor, provided it and the supporting circuitry are functioning:

NOTE	Do not take remove/replacement actions until you have taken other troubleshooting steps. See the troubleshooting checklist.

Code	Description	Problem/Solution
0000	System Board error	POST has detected a failure limited to the system board internal functions. To verify this error: 1. Reboot the NetServer. Skipping this error message and continuing may result in unstable behavior, or a system hang during the boot process. 2. If this error continues, the system board may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
0010	BIOS problem	The PC configuration has been lost, cleared, corrupted, or has not been initialized. When the HP NetServer remains unplugged for a long period of time, the battery will discharge and not provide enough current to keep the CMOS memory powered. To correct this: 1. Verify the battery is properly inserted. 2. If necessary, replace the battery as described in your user's guide. 3. Run the Setup Utility to re-configure your NetServer.
0011	Battery problem	The NetServer BIOS is not responding due to a possible battery discharge. If the HP NetServer was unplugged for a long period of time, the battery will discharge and not provide enough current to keep the system date and time current. To correct this: 1. Verify the battery is properly inserted. 2. If necessary, replace the battery. 3. Set time and date using the Setup utility or from your operating system.
0012	BIOS initialization problem	The HP NetServer configuration has been cleared or has not been initialized. Run the Setup Utility to re-configure your system.
0020	ISA initialization problem (This does not apply to E 800)	The ROM on the accessory board is bad or the board has a conflict with a system board reserved resource (address, DMA, or IRQ). To correct this: 1. Change the resources used by the ISA accessory boards. 2. Try to disable <free> resources used by system board devices. 3. If the problem persists, the accessory board may be defective. Contact the accessory board vendor.
0021	PCI Configuration conflict	A configuration problem has occurred with a PCI device. The PCI device or accessory board doesn't match PC setup settings or has conflicts with PC resources (reserved memory space, IRQ or DMA channels). To correct this: 1. Clear the PCI configuration with the CMOS status switch. Refer to the User's guide for details. 2. If necessary, use the Setup Utility to manually

Code	Description	Problem/Solution
		configure the PCI devices. 3. Check for any further PC resource, which can be used. Use Setup Utility to disable any unused function, such as I/O ports or IDE controllers. 4. Start the Operating System and let it update the PCI configuration.
0022	Plug & Play ISA initialization problem (This does not apply to E 800)	The Plug & Plug ISA accessory board has reported an initialization problem. The ROM on the accessory board is bad or the Plug & Play BIOS cannot solve a conflict issue with a system board reserved resource. To correct this: 1. Clear the Plug & Play configuration with the CMOS status switch. Refer to the User's guide for details. 2. Try to disable (free) resources used by system board devices. 3. Run the Plug & Play utility supported by your Operating System. 4. If the problem persists, the accessory board may be defective. Contact the accessory board vendor.
0030	Processor Speed selection problem (This does not apply to E 800)	POST has detected the processor speed selected with system board switches does not match the processor's speed. Refer to the User's guide for the correct switch setting.
0040	PC Serial Number initialization problem	POST has detected the PC Serial Number has been lost or has not been initialized. Pressing <F2> will automatically run the HP Serial (BIOS) Utility and allow you to enter the Serial Number.
0050	Processor Cooling/Heating problem	POST has detected a cooling fan problem. The processor cooling-fan needs to be connected.
0076	Integrated HP NetRAID processor is not responding. (This does not apply to E 800)	This problem will prevent the operation of the Integrated HP NetRAID, if it is enabled. The problem may also prevent operation of some PCI slots. 1. Flash the Integrated HP NetRAID firmware and reboot the system. 2. If the error persists, your I/O board may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
0100	Keyboard error during POST	A key on the keyboard has been pressed during POST of the HP NetServer. To correct this: 1. Ensure nothing is placed on the keyboard and no key is accidentally pressed down. 2. Reboot the NetServer. 3. If the error persists, your keyboard may need to be replaced. Contact your service representative.
0101	Keyboard error	The keyboard has reported an error during its self-test. To correct this: 1. Restart your HP NetServer. 2. If the error persists, your keyboard may need to be replaced. Contact your service representative.
0102	Keyboard controller error	POST has detected a general failure in the integrated keyboard controller. To verify this error: 1. Restart your HP NetServer. 2. If the error persists, your system board may need to be replaced. Contact your service representative.
0103	Keyboard is not connected.	POST has detected the keyboard is not connected. To correct this: 1. Verify the keyboard connector is firmly connected. 2. Reboot the NetServer. 3. If the problem persists, your keyboard cable may be damaged or your keyboard may need to be replaced. Contact your service representative.
0105	Mouse boot error	The system board has detected a mouse error during POST. To correct this: 1. Clean the mouse and its moving ball as described in the User's Guide. 2. If the problem persists, your mouse may need to be replaced. Contact your service representative.
0106	Mouse is not responding.	The system board has detected the mouse is not responding. To correct this: 1. If the mouse has just been removed, press <Esc > to

Code	Description	Problem/Solution
		automatically validate the change. 2. Otherwise, verify the mouse connector is firmly connected. 3. If the problem persists, your mouse may need to be replaced. Contact your service representative.
0108	Mouse and Keyboard connections reversed	POST has detected the mouse and keyboard connections are reversed. To correct this: 1. Turn the NetServer off. 2. Swap the mouse and keyboard connections. 3. Turn on the NetServer power and reboot the NetServer.
0200	Serial Port Controller resource conflict	POST has detected an address space or IRQ resource conflict between one of the integrated serial port controllers and an accessory board. To correct this: 1. If an integrated serial port is not needed, run the Setup Utility and disable the related serial port. 2. If the integrated serial port is needed and its settings cannot be modified, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0201	Parallel Port Controller resource conflict	POST has detected an address space or IRQ resource conflict between the integrated parallel port controller and an accessory board. To correct this: 1. If the integrated parallel port is not needed, run the Setup Utility and disable the parallel port. 2. If the integrated parallel port is needed and its settings cannot be modified, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0300	Flexible disk drive (A) boot error	POST has detected the flexible disk drive (A) reported an error during its self-test. To correct this: 1. Verify a diskette can be properly inserted and

Code	Description	Problem/Solution
		removed from the flexible disk drive. 2. Verify the flexible drive type configured in the Setup utility matches the flexible disk drive installed in the HP NetServer. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative.
0301	Flexible disk drive B boot error (This does not apply to E 800)	POST has detected the flexible disk drive B reported an error during its self-test. 1. Verify a diskette can be properly inserted and removed from the flexible disk drive. 2. Verify the flexible drive type configured in the Setup utility matches the flexible disk drive installed in the HP NetServer. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative.
0305	Flexible Disk Drive Cable conflict (This does not apply to E 800)	The flexible disk drive A is connected to the connector configured for flexible disk drive B. 1. Run Setup Utility by pressing <F2>. In the flexible disk drive section, enable the A & B flexible disk swap. 2. Alternatively, if the connector allows it, connect the flexible disk drive to the other connector on the flexible disk drive cable.
0306	Flexible disk drive controller boot error	POST has detected a general failure on the integrated flexible disk controller. To verify this: 1. Restart your HP NetServer. 2. If the error persists, your system board may need to be replaced. Contact your service representative.
0307	Flexible disk drive controller resource conflict	POST has detected an address space or IRQ resources conflict between the integrated flexible disk controller and an accessory board. To correct this: 1. If the integrated flexible disk controller is not needed,

Code	Description	Problem/Solution
		run the Setup Utility and disable the flexible disk controller. 2. If the integrated flexible disk controller is needed, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0400	CD-ROM boot error	POST has detected the CD-ROM drive has reported an error during its self-test. To correct this: 1. If a CD-ROM disk is present, verify it is correctly inserted. 2. Verify the CD-ROM drive door or tray has not been opened or closed during the self-test. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative.
0401	CD-ROM drive not responding	POST has detected the CD-ROM drive is not responding, but is configured in the Setup utility. To correct this: 1. If the CD-ROM drive has just been removed, press <F4> to automatically validate the change. 2. Verify all data cables and power cables are firmly connected. 3. If the cable is damaged, connect the CD-ROM to another cable, if available. The Setup Utility and the 32-bit disk access driver may need to be modified accordingly. 4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative.
0500	Hard Disk (primary) controller boot error	POST has detected a general failure on the integrated (primary) hard disk controller. To correct this: 1. Restart your HP NetServer. 2. If the error persists, your system board may need to be replaced. Contact your service representative. (The following does not apply to E 800) 1. If no device uses the other IDE channel, connect your hard disk drive to the other cable to operate with

Code	Description	Problem/Solution
		the secondary controller. Verify the secondary IDE controller is enabled in Setup. 2. If the IDE device operates with the secondary channel, your system board may need to be replaced to recover primary channel functionality. Contact your service representative. 3. If the device does not operate on either channel, the IDE device may be defective. Contact your service representative.
0501	Hard Disk secondary controller boot error (This does not apply to E 800)	POST has detected a general failure on the integrated secondary hard disk controller. 1. If no device uses the other IDE channel, connect your hard disk drive to the other cable to operate with the primary controller. Verify the primary IDE controller is enabled in Setup. 2. If the IDE device operates with the primary channel, your system board may need to be replaced to recover secondary channel functionality. Contact your service representative. 3. If the device does not operate on either channel, the IDE device may be defective. Contact your service representative.
051X	Hard Driver boot Error (Error codes #0510, #0511, #0512, and #0513 apply to IDE0, IDE 1, IDE 2, and IDE 3 respectively as described in the Setup Utility). (This does not apply to E 800)	POST has detected the specified hard disk drive reported an error during its self-test. To correct this: 1. Check the hard disk drive configuration with the Setup Utility. 2. If necessary, edit the user hard disk parameters to set lower values. 3. If the problem persists, your drive may need to be replaced. Contact your service representative.
052X	Hard Drive not responding (Error codes #0520, #0521, #0522, and #0523 apply to HDD0, HDD1, HDD2, and HDD3 respectively as described in the Setup Utility). (This does not apply to E 800)	POST has detected the specified hard disk drive is not responding, but is configured in the Setup utility. To correct this: 1. If the specified hard disk has just been removed, press <F4> to automatically validate the change. 2. Verify all data cables and power cables are firmly connected. 3. If the cable is damaged, connect the hard disk drive to another IDE cable, if available.

Code	Description	Problem/Solution
		4. If the problem persists, your hard disk drive may need to be replaced. Contact your service representative.
053X	Hard Disk drive connection problem (This does not apply to E 800) (Error code #0530 is the primary channel cable IDE1 and #0531 is the secondary channel cable IDE2)	POST has detected a hard disk drive on the second <slave> position on the IDE cable, but no hard disk has been found on the first <master> position. To correct this: 1. If only one hard disk is connected on the cable, disconnect the hard drive and use the other connector to re-connect the hard drive into the first <master> position. 2. If two disks are connected on the cable, verify all data cables and power cables are firmly connected for both hard disk drives. 3. If the error message appears just after a hard disk drive installation, check for master/slave specific jumper configurations in the hard disk drive installation manual. 4. If the problem persists, the hard disk drive may need to be replaced. Contact your service representative.
0540	Hard Disk Controller resource conflict	POST has detected an address space or IRQ resource conflict between the integrated hard disk controller and an accessory board. To correct this: 1. If the integrated hard disk controller is not needed, run the Setup Utility to disable it (primary or secondary). 2. If the integrated hard disk controller is needed, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0600	Video Memory boot error (This does not apply to E 800)	The video memory size detected during POST is smaller than previously detected. To correct this: 1. If you have changed your video adapter, press <F4> to automatically validate the change. 2. If the problem persists, the system board may need to be replaced. Contact your service representative.
0700	DIMM size boot error	The system memory size detected during the POST is smaller than previously detected. One or several DIMMs are

Code	Description	Problem/Solution
		either disconnected, or have been replaced by smaller ones. To correct this: 1. If some main DIMMs have just been removed or replaced by smaller ones, press <F4> to automatically validate the change. 2. If no DIMM has been removed or changed, ensure all DIMMs are properly inserted in the slots. 3. If the problem persists, one of DIMMs may need to be replaced. Contact your service representative.
0712	DIMM installation error	POST has detected an incorrectly installed DIMM or the failure of one or more DIMMs. To correct this: 1. If additional memory was just installed in your NetServer, please verify the installation conforms to the description in the User's Guide. 2. If this error was reported when no additional memory was just installed, restart the NetServer. 3. If the error persists, contact your service representative.
0713	Incorrect DIMM installed	POST has detected one or more DIMMs are not the correct type, or the correct speed. To correct this: 1. If additional memory was just installed in your NetServer, please verify the correct DIMM type and speed for this NetServer was installed. Refer to the DIMM description in the User's Guide. 2. If this error was reported when no additional memory was just installed, restart the NetServer. 3. If the error persists, contact your service representative.
0800	Cache memory size error	POST has detected the cache memory size is smaller than previously detected. To correct this: 1. If the processor module has just been replaced, press <F4> to automatically validate the change. 2. If the problem persists, the processor module may need to be replaced.
0801	Cache boot error	POST has detected an error in the cache memory module. To correct this:

Code	Description	Problem/Solution
		1. Verify the processor module is installed correctly. Refer to the User's Guide for handling precautions. 2. If the problem persists, the processor module may need to be replaced.
0900	Integrated LAN disable error	The system could not disable the integrated LAN. To correct this: 1. Reset the Integrated LAN by powering off the HP NetServer. 2. Disconnecting the power cord for 20 seconds. 3. Reconnect the power cord and power on the HP NetServer. 4. If the error appears upon restarting, update the system BIOS. 5. Insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system. This will initialize the flash utility on HP Navigator CD-ROM. 6. If the error persists, the system board may need to be replaced. Contact your service representative.
0901	Integrated LAN enable error	The system could not enable the integrated LAN. To correct this: 1. Reset the Integrated LAN by powering off the HP NetServer. 2. Disconnecting the power cord for 20 seconds. 3. Reconnect the power cord and power on the HP NetServer. 4. If the error appears upon restarting, update the system BIOS. 5. Insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system. This will initialize the flash utility on HP Navigator CD-ROM. 6. If the error persists, the system board may need to be replaced. Contact your service representative.
0A00	Display refresh rate error	The parameters returned by the display do not match the DDC standard used by the NetServer for automatic setup of ergonomic refresh rates. To correct this: 1. Disable the 'Plug & Play Display' feature in the Setup

Code	Description	Problem/Solution
		Utility to avoid a blank or unreadable screen at power-up. 2. Use the Setup Utility to manually set the video refresh rates to the highest ergonomic refresh rates supported by the display. Refer to display monitor's User's Guide for specifications.
0B3x	Processor Module conflict	POST has detected the processor modules installed in the NetServer are not the same type or speed. To correct this: 1. Ensure both processor modules in the NetServer have the same product code, which should include the type, heat sink, and speed. 2. If not, replace one or both to ensure both are the same product code. This problem must be corrected to avoid possible malfunction or reliability problems.

5 Troubleshooting

Preventive Maintenance Procedures

Refer to this table for preventive maintenance procedures for this NetServer. Be sure to turn off power to the NetServer when cleaning it.

Preventative Maintenance Procedures

Component	Time Frame	Maintenance Procedure
Keyboard	Regularly	Dust with damp, lint-free cloth.
Monitor screen	Regularly	Use "HP Video Screen Cleaning Solution" found in 92193M Master Clean Kit.
Mouse	Regularly	Refer to the mouse's manual for mouse maintenance procedures.
Tape drive heads	Monthly	Use "Magnetic Head Cleaning Solution" found in the 92193M Master Clean Kit.
Cooling fans and grilles	6 Months	Check functions of cooling fans and clean the intake openings on the chassis of dust, lint, and other obstructions to airflow.

CAUTION	Do NOT use petroleum-based cleaners (such as lighter fluid) or cleaners containing benzene, trichlorethylene, ammonia, dilute ammonia, or acetone. These chemicals could damage the keyboard's plastic surfaces.

HP recommends the periodic cleaning of tape heads, capstans, and guides on HP drive units and those products using high-density data cartridges and mini-data cartridges. This maintenance procedure prolongs tape and head life and helps reduce read/write errors due to dust and oxide

Troubleshooting Tips

WARNING	Before removing the top cover, always disconnect the power cord and unplug telephone cables. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.

- For problems with the HP NetRAID controller, refer to the appropriate HP NetRAID manuals.
- For problems with HP TopTools, refer to the *HP TopTools Administrator Guide* on the HP Web Site at

  http://www.hp.com/toptools
- For general information on management products, refer to

  http://www.hp.com/go/netserver_mgmt

  and search for "management."

Troubleshooting Checklist

To troubleshoot an installation problem, do the following:

- First, ensure the NetServer is configured properly.

  Most NetServer problems are the result of incorrect BIOS and SCSI configurations.
- If it is a network-related error, determine if the NetServer has enough memory and hard disk drive capacity.

  Consult your network operating system manual and its requirements.
- Verify all cables and boards are securely plugged into the appropriate connectors or slots.
- Remove all options added since the NetServer was received and then add one option, and only one option, at a time.

NOTE	If the NetServer has a large amount of memory installed, it may take 30 seconds for the first screen to display.

If it is a hardware error, follow these steps:

1. Log users off the LAN and power down the NetServer.
2. Remove the NetServer's cover.

WARNING	Before removing the cover, always unplug telephone cables and disconnect the power cord. Unplug telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.

3. Simplify the HP NetServer configuration to the minimum required:

   A monitor, one flexible disk drive, one CD-ROM drive, one hard disk drive, keyboard, mouse, and NIC. Remove all third-party options, and reinstall one at a time, checking the NetServer after each installation.
4. Boot the NetServer.
   - ◊ If the NetServer does not function, consult the troubleshooting steps in the section "Hardware Problems."
   - ◊ If you get an error message, see the section "Error Messages" below.
5. If the NetServer still will not boot, clear the CMOS memory and reboot. See "Clearing the CMOS Configuration".

If the NetServer Does Not Power On

Follow these steps if the power/activity light does not light green after you press the power-on button:

1. Remove the AC power cord, wait 15 seconds, reconnect the power cord, and try again.
2. Verify all cables and power cords are firmly plugged into the respective receptacles.

3. If the NetServer is plugged into a switched multiple-outlet box, ensure the switch on the outlet box is turned on.
4. Plug a different electrical device (such as a printer) into the power outlet, and turn on the device to verify the outlet has power.
5. Verify the power supply is firmly connected to the system board connector.
6. Verify the front panel power switch is connected to the system board.

If the NetServer Powers On, but Fails POST

Do one of the following:

- If the NetServer fails POST and an error message appears, refer to the section "Error Messages." If the suggested solutions do not solve the problem, contact HP or your reseller.

If the NetServer Passes POST, but Does Not Function

If an error message appears, read the error message text for actions to take. If the actions do not solve the problem, contact HP or your reseller.

If there is no error message, follow these steps:

1. Verify the NetServer is configured correctly in the Setup Utility.
2. If the NetServer still does not work, turn it off and remove all external peripherals, except the monitor and keyboard. Test to see if the NetServer now works.
3. If the NetServer still does not work, turn off the monitor, the server, and all external devices, and check the internal hardware, as follows:
   a. Unplug the power cord and all telephone cables. Remove the NetServer cover.
   b. Verify all accessory boards are firmly seated in their slots.
   c. Ensure all disk drive power and data cables are securely and properly connected. Verify the mass storage configuration with the cabling diagrams shown on the Technical Reference Card, located in a plastic pouch on the interior of the NetServer cover.
   d. Verify the DIMMs are firmly seated on the System Board. Verify all added DIMMs are HP DIMMs.
   e. Replace the NetServer cover, and lock the NetServer.
   f. Replace all power cord and cables.
   g. Turn on the monitor.
   h. Turn on the server.
   i. Check for error messages.
4. Copy DiagTools from the *HP NetServer Navigator CD-ROM* to diskette, and run it from diskette.

BIOS Recovery

If the BIOS becomes corrupted, it is possible to perform a BIOS recovery to correct the condition. To recover the BIOS it is necessary to:

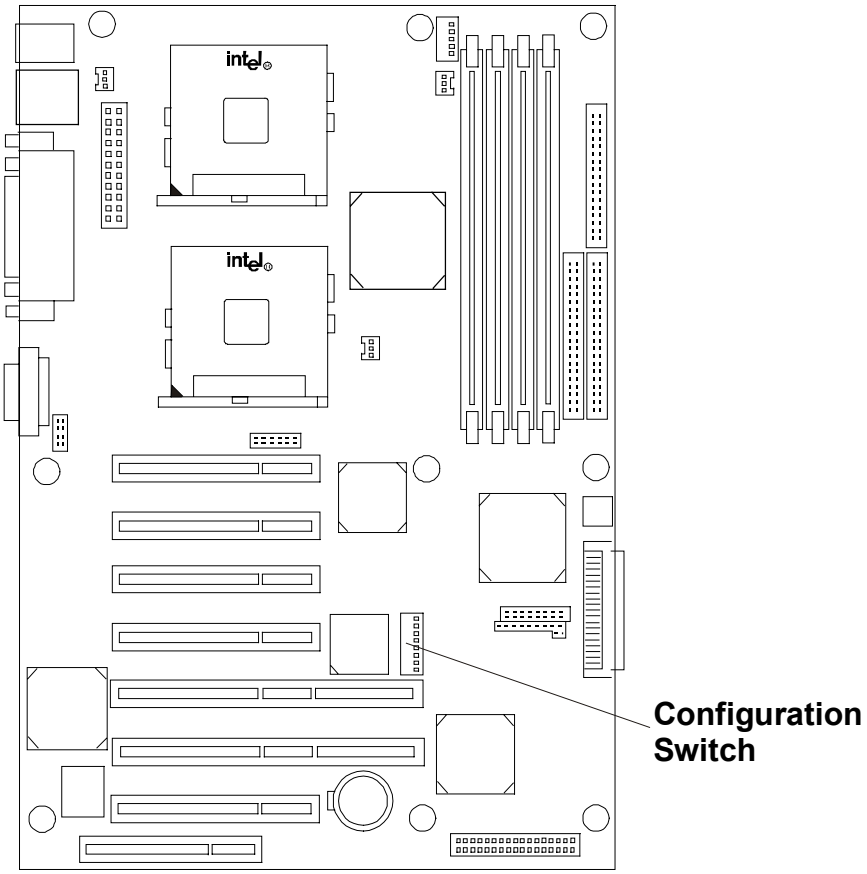
1. Create a BIOS Update diskette from the HP NetServer Navigator CD-ROM.

2. Power down the NetServer, gain access to the system board assembly, and set the Boot Block switch of the configuration switch to the ON position.
3. Replace the system board assembly and power on the NetServer with the BIOS Update diskette in the flexible disk drive.
4. The flash RAM program on the BIOS Update diskette will restore the BIOS to the NetServer.
5. Power down the NetServer, gain access to the system board assembly, and set the Boot Block switch of the configuration switch to the OFF position.
6. Replace the system board assembly and power on the NetServer in the normal manner.

A BIOS Update diskette must be created from the HP NetServer Navigator CD-ROM to be used in flashing the new BIOS into the NetServer. To update the BIOS, you enable the Boot Block by setting the Boot Block switch (switch 7) of the configuration switch on the system board assembly to the ON (enabled) position.

To perform a BIOS recovery:

1. Power down the HP NetServer and gain access to the system board assembly.
2. On the system board, set the Clear Configuration switch (Switch 4), on the configuration switch, from OFF to ON.



System Board Configuration Switch

3. Replace the system board assembly.
4. Place the previously created BIOS Update diskette into the flexible disk drive of the NetServer and power up the HP NetServer.

5. The flash program on the diskette will re-program the BIOS into the NetServer.
6. When the flash programming is completed, power down the HP NetServer.
7. Gain access to the system board assembly and set the Clear Configuration switch (Switch 4) from ON to OFF
8. Replace the system board assembly in the NetServer and replace all covers.
9. Power on the NetServer in the normal manner.

Password Problems

This section describes some common password problems.

Resetting Lost Passwords

If you have forgotten the User or Administrator password, you can reset each one. The User password can be reset if you know the Administrator password, but the Administrator password can only be reset by a switch on the system board.

User Password

If you have forgotten the User password, but the Administrator password is known, perform the following steps:

1. Restart the NetServer.
2. During the boot process, press **[F2]** to start the Setup program.
3. Enter the Administrator password and then access the Security menu of the Setup Utility.
4. Scroll to the "User Password is" field and press **Enter**.
5. Enter the Administrator password as the old password and press **Enter**.

   This will replace the old, forgotten password.
6. Enter the new password in the "Enter new password: [ ]" field and press **Enter**.

NOTE	Entering nothing or "blank" in the "Enter new password" field followed by entering nothing or "blank" in the "Re-enter new password" field will turn off the password setting, changing it to "Not Set."

7. Enter the new password again in the "Re-enter new password: [ ]" field and press **Enter**.
8. Press **Esc** and scroll to the Exit menu and save the changes to save the new password.

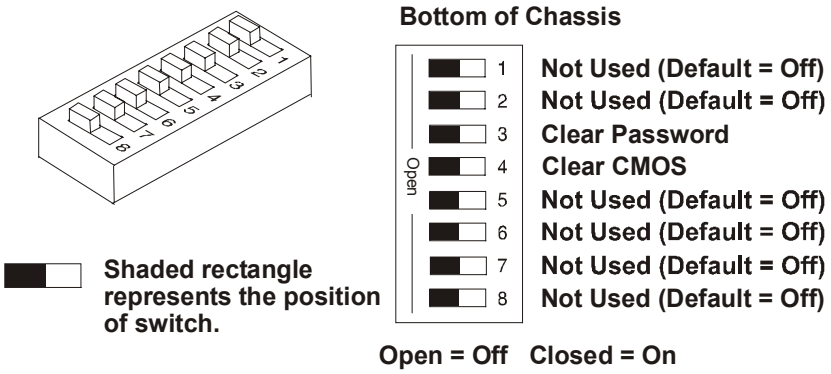
Administrator Password

You can only reset a forgotten Administrator password by using the configuration switch on the system board. If you have forgotten the Administrator password, your NetServer will function normally, but you will not be able to access the Setup Utility or complete the boot process, if you reboot the NetServer. To reset the Administrator password, refer to the following procedure.

1. Turn off power to the HP NetServer.
2. Remove the cover.

3. Move switch 3 in the configuration switch on the system board (labeled "Clear Password") to the ON position.
4. Turn on power to the NetServer and allow it to complete its startup routine.

   The old password will be erased.
5. Turn off power to the NetServer.
6. Return switch 3 in the configuration switch on the system board to the OFF position.
7. Replace the NetServer cover.
8. Turn on power to the NetServer and allow it to begin its startup routine.
9. If you wish to set a password again, press **[F2]** to start the Setup Utility.
10. Set the new Administrator password.
11. Choose the Exit option and save the changes to save the new password.


Bottom of Chassis
Open
1 Not Used (Default = Off)
2 Not Used (Default = Off)
3 Clear Password
4 Clear CMOS
5 Not Used (Default = Off)
6 Not Used (Default = Off)
7 Not Used (Default = Off)
8 Not Used (Default = Off)
Shaded rectangle represents the position of switch.
Open = Off Closed = On

General NetServer Problems

No lights are on and no error message appears

If the NetServer does not work (no lights are on, including backlighting on models with LCDs) and no error message appears, check the following:

1. Verify that power is good and available
2. Make sure that the NetServer is turned on (the power-on light should be green and the fans should be on).
3. Turn the NetServer off and unplug the power cords. Wait 30 seconds and plug the power cords in and turn the NetServer on. Verify the failure.
4. Verify all boards are installed properly and seated firmly in the slots with cables firmly connected.
5. If the NetServer stopped working after you installed a new accessory, remove the accessory and turn on the server. If the NetServer now works, go to step 8.
6. If the NetServer still does not work, remove all accessory that you have installed (do not remove the flexible or hard disk drives) and turn on the server.
7. If the NetServer now works, turn off the NetServer; add one accessory at a time to determine which one is causing the problem. Turn on the NetServer after installing each board or option. When the problem returns, the last board or option installed is defective.

8. If you have added any memory, make sure that the modules are seated properly on the processor board.

The application or operating system is not responding properly

1. In NetServer models with accessible cache feature, determine if the memory cache feature is turned on or off.

   Memory cache may need to be turned off for some older software. It may also need to be turned off for those accessory boards that have on-board firmware, and for those boards that use memory-mapped I/O.

2. If necessary, turn off the memory cache feature. Check the state of memory cache and, if necessary, disable it:

   a. Push **F2** during the boot process

   b. Go to configuration and turn off Memory Caching

The NetServer stops working (hangs)

Typically, if the NetServer hangs before the end of the **POST** completes, the problem is probably a hardware failure. If the NetServer hangs after the **POST** completes, the problem is probably due to an incorrectly configured or corrupt driver, operating system, or application program, or a media (disk drive) error.

If the NetServer stops working, try the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Turn the NetServer off and unplug the power cords. Wait 30 seconds and plug the power cords in and turn it on. Verify the failure.
3. If the problem persists, replace the system board.
4. Once a problem has been found with a part, verify that it is the problem (or the only problem) by reinstalling the part and replicating the error.

The NetServer does not start (boot)

Locate the memory modules (SIMMs/DIMMs).

NOTE	The POST error messages reflect which modules are defective and should be replaced.

1. Review the **Troubleshooting Checklist** before you continue.
2. Power the NetServer off and on (rather than using Ctrl-Alt-Del) as it is a more complete system reset.
3. On NetServers with diagnostic LEDs near the DIMM sockets, note any blink codes.
4. If the POST reports a problem, check the error against the Error Messages and correct the problem.
5. Verify the video subsystem is configured correctly.
6. Verify the memory DIMMs are all of the same (specified) speed.
7. Verify the memory DIMMs are installed and configured correctly:

   a. Make sure only HP-supported DIMMs are used.

b. Remove the system board, install a known good memory module, and reboot. If you still receive an error, replace the system board.

If the error goes away, add another module and reboot again. Continue this process until you have installed all memory modules or you experience a failure. Replace the defective module(s).

8. Remove one accessory board at a time and reboot the NetServer. Verify the problem.
9. Once a suspect part has been found, verify that it is the problem by reinstalling the part and duplicating the error.

Power Problems

Symptoms:

- A fan is not working
- The power LED does not light

1. Review the **Troubleshooting Checklist** before you continue.
2. Verify the AC power source is good:
   a. If the NetServer fans are audible or a control panel light is on, the power is on.
   b. Verify the circuit breaker for the AC power outlet.
   c. If the breaker was off, check that all devices connected the NetServer share the same circuit breaker and are the only devices on it. Reset the circuit breaker after reconfiguring the devices, if need be.
   d. Verify the AC power outlet is not faulty. Test it by plugging in a known-good device.
   e. Verify the third-wire ground is isolated from other grounds and is at ground potential.
3. Verify all cable connections:
   ◊ AC power cords from AC source outlet to server
   ◊ DC Power supply cables to all NetServer PCBs
   ◊ DC power supply cables to disk drives and/or mass storage cages
4. If the fans aren't audible and the above steps are verified, check that power is getting to all fans. HP NetServers have multiple fans. All fans run when power is turned on; all are off when the power is off.

   With the power supply connected to the system board, check the power supply's voltages.
5. If voltages are not present:
   a. Turn off AC power.
   b. Disconnect the power cords for 5 minutes in order to reset the power supply's circuitry.

   Turn on AC power again. If power is still not getting to the system board, replace the power supply (or power supply module on some NetServer models).
6. If power is getting to the fan but the fan isn't working, replace the fan (or replace the power supply in NetServer models with fans incorporated in the power supply).
7. If the problem continues, replace the power supply module.

8. If, after replacing the power supply, the problem persists:
    a. Remove all accessory boards, including any hard disk drive controller board or the video board the customer might have installed, and reboot the NetServer.
    b. Disconnect all mass storage power cords and cables (except those to the boot device) and reboot the NetServer.
9. If the problem goes away, reinstall the original suspected part to verify that it is causing the problem.

Video/Monitor Problems

Symptoms:

- Nothing is displayed on the monitor.
- The monitor is blank.
- The wrong size characters appear on the monitor.
- Colors are wrong or there are no colors on the monitor.

If you installed a video board and are not using the built-in video system, go to Step 12.

If you have two video monitors connected, test the monitors to make sure they are working (Step 1-4) then go to Step 10.

1. Review the **Troubleshooting Checklist** before you continue.
2. Check the contrast and brightness controls to ensure each is adjusted.
3. Verify the video and power cords are connected to the monitor.
4. Ensure there is adequate power:
    a. Verify the display power switch is turned on.
    b. Verify the display power cord is connected to an AC power outlet and the video cable connected to the server's video connector.
    c. Plug in a known working device to ensure there is power to the outlet or use the proper testing device to check the power outlet.
    d. Turn the monitor off and on, and if the monitor has an on/off LED, see if it lights.
    e. Turn the Clear Configuration switch on the system board to OFF and reboot the NetServer. Check if the problem persists.
5. Turn on the NetServer and wait a full 2 minutes. Verify the monitor starts displaying normally.
6. If the problem persists, and if the power cord is detachable, try a known good power cord.
7. Unplug the power cord and wait 30 seconds. Plug in the power cord and turn on the NetServer. Wait a full 2 minutes. Check that the monitor starts displaying normally.
8. Check the monitor display to see if the system memory count takes place correctly.
    a. Turn the NetServer off and then on. Check to see if the memory is counted during the NetServer boot. If no count occurs, go to Step 10.
    b. Check to see if the count occurs in the color appropriate for the monitor.

    If the count occurs in the wrong color, the problem may be with the video subsystem, the monitor, or the monitor cable. (Continue with the troubleshooting steps.)

9. If you are using a video screen saver utility and the screen goes blank while using the keyboard, you may be using an application that turns off the screen even when you are using the keyboard. Refer to the manual that came with the screen saver utility.
10. Ensure the memory modules (DIMMs) are correctly seated in their slots. You may want to remove and reinstall each memory module to ensure it does not cause the problem. Verify the correct type, size, and combinations of modules for this model NetServer are installed.
11. To see if the display is functioning:
    a. Turn off the monitor and the server.
    b. Disconnect the video cable from the video connector.
    c. Turn on the monitor.

    Monitor Notes:

    - ◊ When most EGA and VGA monitors are disconnected from the video connector, if the monitor is working, the screen is white.
    - ◊ When some monitors (such as HP high-resolution monitors) are disconnected from the video connector, the monitor may be working, although the screen is black.
    - ◊ If the display is black or white when it should be in color, check the monitor cable to see if a pin is bent. If a pin is bent, slowly but carefully straighten the pin. Replace the cable if the pin cannot be straightened successfully.
    - ◊ If a monitor tester is available, use it to check the display.
    - ◊ If you suspect the monitor is faulty, replace it with a known good monitor. Then reinstall the original monitor and duplicate the error.
12. Verify the monitor is working by plugging it into a know-good NetServer or computer.
13. Check to see if the monitor connector's pins are bent. If the pins are bent, slowly but carefully straighten each pin.
14. Connect the monitor cable to the NetServer video connector and turn on the NetServer. If there is a display, but characters are the wrong size or the display is the wrong color:
    a. Check whether the monitor is a color or monochrome monitor.
    b. Verify the video cable is properly inserted in the connector on the back of the computer.
    c. Check for bent pins on the connectors.
15. If the customer has installed a video board instead of using the built-in video, make sure all jumpers and switches are set properly on the installed video board. (See the manual for the video board.)
16. If the monitor displays a badly scrambled image that looks to be the current screen image, then the monitor is not synchronizing correctly.

    - ◊ If a video board is installed, replace it with a known good one. The video timing setting on the board may be bad.
    - ◊ If it is the on-board video, replace the system board.
17. If a video board is installed and the built-in video is used:
    a. Make sure the video board/built-in video combination is supported. Usually, two video systems (for example, internal video and a video adapter board) cannot be used at the same time.
    b. If there is still a problem, make sure the board is seated correctly.

c. If there is still a problem, remove the video adapter board, and enable the internal video system. Verify the problem.

18. If a message appears such as "INVALID CONFIGURATION", run the **Setup Utility** and press **[F2]** during the boot process or boot the HP Navigator CD-ROM) to confirm the NetServer video configuration. Make sure other accessory boards do not use the same memory addresses as the HP video system.
19. If the problem is isolated to the built-in video system, replace the system board.
20. Once a suspect part has been found, verify it is the problem by reinstalling the part and duplicating the error.

Configuration Problems

Symptom:

- An installed driver cannot find a PCI board

Installing a PCI board which bridges the two system PCI buses (certain adapter boards provide this feature) can cause previously installed PCI drivers to not recognize their adapter board(s).

To resolve the configuration problem, move the PCI board that has bridging capability to a primary PCI slot.

Symptom:

- The configuration cannot be saved and the battery loses power

Refer to this section if the NetServer frequently loses date and time that may be caused by the battery losing power.

1. Review the **Troubleshooting Checklist** before you continue.
2. If the NetServer frequently loses the time and date, replace the battery. The battery is attached to the system board.
3. Set the new date and time, and reset the configuration parameters using the Setup Utility, if necessary.
4. Turn off AC power to the NetServer, then reboot to see if the date and time was saved.
5. If date and time are still requested, and the battery is good, perform the next procedure, below.

If your HP NetServer repeatedly loses its configuration or the clock stops, you should replace the battery or install an external battery.

WARNING	There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Symptom:

- The configuration information is frequently lost and the battery is good

If the battery is good and you cannot save system configuration, do the following

1. Review the **Troubleshooting Checklist** before you continue.
2. Configuration information is saved in the CMOS. If you continue to loose configuration information and the battery is good, or you cannot save the information to the CMOS:
   a. If possible, using the configuration utility, save the current configuration to a diskette.
   b. Replace the system board.

Printer/Datacomm Problems

Symptom:

- A printer does not print or datacomm devices are not working

If the printer does not work, or the datacomm devices are not working, do the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Verify correct cables have been used, the cables are connected properly, and the cable pins are not bent.

   Check the cable for continuity, or try a known good cable. Refer to the peripheral's manual.
3. Verify the AC power cord is plugged into the power source and the printer.
4. Ensure the printer power switch is on.
5. Ensure the AC outlet is working. If the printer is plugged into a multiple-outlet box, make sure the switch on the outlet box is turned on, and the circuit breaker (if equipped) is not tripped.
6. Ensure the printer is on-line.
7. Examine the printer for a paper jam.
8. Run the printer internal self-test (if it has one) to make sure that the printer is functional. Refer to the printer’s manual for instructions.
9. Ensure you have selected the correct port setting when you configured the printer. The printer must be configured correctly for the NetServer and for the application. You may need to change some switch settings on the printer.
10. Ensure you have not disabled the I/O ports. Run the Setup Utility (press **[F2]** during the boot process) and verify the I/O port status.
11. Ensure the server’s printer port is working properly by running another peripheral from that port.
12. If the printer still does not work, it may have a resource conflict with another board or accessory. Remove boards and accessories (except the hard disk drive) one at a time to isolate the conflict. Check the printer for proper operation after you remove each board or accessory.
13. If an error message appears on the screen, refer to **Error Messages** and the printer’s manual for help.
14. If the NetServer was working before you installed the accessory, remove the accessory and restart the NetServer.
15. If the problem persists, replace the system board.

Keyboard and Mouse Problems

Symptoms:

- The keyboard does not work
- A character is not displayed when a key is pressed

1. Review the **Troubleshooting Checklist** before you continue.
2. Ensure the keyboard is not locked.
3. Ensure the keyboard cable connections at the rear of the NetServer and at the back of the keyboard are securely and correctly attached.
4. If a keyboard/monitor switchbox is used with this NetServer, plug the keyboard directly into the keyboard port of the NetServer. Verify the problem.
5. If the problem persists, turn off the NetServer and back on by using the power button.
6. Try replacing the keyboard with a known good keyboard.
7. If the problem persists, check the keyboard cable for continuity, or try a known good cable.
8. If the problem persists, replace the system board.
9. Once a suspect part has been found, verify that it is the problem by reinstalling the part and duplicating the error.

Symptom:

- The mouse does not work or is intermittent

The HP NetServer automatically detects a mouse when one is installed. If the mouse or other input device is not working, perform the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Check that the mouse cable is properly and securely connected to the server.
3. If a keyboard/monitor switchbox is used with this NetServer, plug the mouse directly into the keyboard port of the NetServer. Verify the problem.
4. Ensure mouse's port does not have a resource conflict. Use the Setup Utility (press [F2].
5. Ensure correct mouse driver has been installed onto the boot drive. Refer to the mouse installation manual or the operating system manual.
6. Replace the mouse with a known-good unit.
7. If the problem persists, replace the system board.
8. Once a suspect part has been found, verify that it is the problem by reinstalling the part and duplicating the error.

Flexible Disk Drive Problems

Symptoms:

- There are lost clusters

- There are read/write errors
- The NetServer will not start from a diskette

If you cannot boot from, write to, or format the flexible disk, do the following:

1. Review the **Troubleshooting Checklist** and read about **Boot Device Priority** before you continue.
2. Try booting from a good known flexible disk.
3. Check to see if boot from CD-ROM is enabled and if there is a bootable CD in the CD-ROM drive.
4. Select the Setup Utility (press [F2] during the boot process and check that the NetServer's mass storage configuration is correct. If for some reason you cannot run the Setup, you can clear CMOS and reconfigure the server.

   Try to reboot.
5. If you cannot format or write to a flexible disk:

   ◊ Ensure diskette is not write protected.

   ◊ Ensure disk drive is properly configured with the Setup utility. Make sure that "Start from Flexible Disk" option is disabled.
6. Verfiy all internal drive cables are securely attached and functional. Inspect the cables and reseat the connectors at both ends.
7. If the cables are securely attached, and the drive still does not work, replace the cables with known good cables, one at a time.
8. If the problem persists, and/or there is an error code, replace the faulty part (the drive, the system board, etc.)
9. If the problem persists, check for environmental problems that can damage disk media and disk drive heads.

   Environmental problems result from:

   ◊ Radiated Interference: Sources include communications and radar installations (such as at an airport), radio/TV broadcast transmitters, and hand-held receivers.

   ◊ Airborne Contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

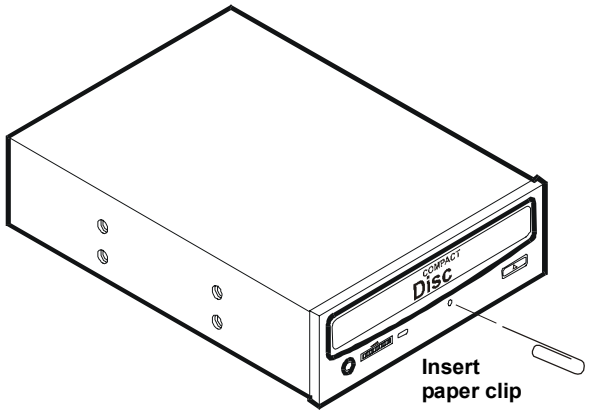
CD-ROM Problems

Symptom:

- The CD-ROM drawer will not open

If the CD-ROM drawer fails to open when you press the Eject Button or with software commands, do the following:

1. Turn off all power to the computer.
2. To open the drawer, insert a pointed object, such as a paper clip, into the emergency eject hole and push in about 1.75 inches (40 mm).



3. Remove the disk and close the drawer.
4. After you remove the disk, start the computer and try to open the drawer again with the Eject Button or software commands.
5. If the drawer still will not open, replace the CD-ROM drive with a working unit.

Symptom:

- The CD-ROM drive is not working properly

The CD-ROM drive that comes with certain HP NetServer models is a SCSI device; others are IDE devices. If the CD-ROM drive does not work, do the following:

1. Review the basic SCSI installation guidelines to ensure a proper configuration.
2. In addition, check the following:
   - ◊ Verify correct drivers are installed.
   - ◊ Verify a CD-ROM disk in the CD-ROM drive.
   - ◊ Verify all internal drive cables are securely attached and functional.
3. If the drive is a Hewlett-Packard CD-ROM drive, review the *CD-ROM Installation Guide* for any special installation instructions.
4. Try installing a known good CD-ROM drive
5. If the problem persists, check for environmental problems that can damage disk media and disk drive heads. Environmental problems result from:
   - ◊ Radiated Interference: Sources include communications and radar installations, radio/TV broadcast transmitters, and hand-held receivers.
   - ◊ Airborne Contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

Symptom:

- The NetServer won't boot from the CD-ROM

Use the Setup Utility to make sure the CD-ROM drive is bootable:

1. Review the **Troubleshooting Checklist** and **Boot Device Priority**
2. Run the Setup Utility.
3. Enable support for bootable CD-ROM.

4. Save and exit the utility.

SCSI Problems

Symptom:

- The external SCSI subsystem does not work after installation

If the external SCSI subsystem does not work after installation, do the following:

1. Review the **Troubleshooting Checklist** and read **Mass Storage Guidelines**.
2. Run the **DiagTools** and verify the integrity of the SCSI buses, and other switch settings on the external storage devices are correct. Verify that each SCSI device is assigned a unique SCSI ID.
3. Refer to the documentation that came with the SCSI devices for any specific information on installing them.
4. Ensure all installed SCSI controllers are installed and configured correctly.
5. For any SCSI devices installed in an enclosure external to the NetServer chassis, make sure that Ultra SCSI is disabled on this controller. SCSI devices external to the NetServer chassis are supported in Fast SCSI mode only.
6. Check the SCSI cables for problems that may have been caused by recent computer maintenance, hardware upgrades, or physical damage.
7. Check the ROM BIOS version to make sure it is the most recently issued version. Booting the most recent version of the *HP NetServer Navigator CD-ROM* will automatically report if the BIOS is not current and needs updating (“flashing”). Follow the instructions in the screen to update the BIOS.
8. Check that the external SCSI subsystem BIOS is being executed properly.
   - ◊ When you start the server, the incrementing count of the RAM appears on the screen. Then the external SCSI BIOS displays a banner and a copyright notice.
   - ◊ The BIOS then checks for valid devices on the SCSI bus, and reports which devices are found. If you have installed and configured the SCSI devices correctly, you will see a list confirming all SCSI devices installed in the NetServer.
   - ◊ If the banner is not displayed, the external SCSI controller is not recognized.
9. Verify the SCSI bus is terminated at both ends. By default, HP SCSI controllers are terminated. When a device is connected to a connector on the controller, bus termination for that connector is disabled. Verify that the last device on the bus is terminated.
10. Ensure no device is set to SCSI ID7; this is the SCSI ID used by the SCSI controller.
11. Verify all SCSI devices are either single-ended or differential SCSI devices (depending on the NetServer model), and that any bus does not contain both types.
12. Verify the SCSI hard disk drive that loads the operating system is set to the lowest SCSI address (usually set to 0).
13. If a second hard disk drive is connected to the SCSI cable, check it for proper SCSI address, SCSI cable connection, proper power, and jumper settings.
14. Disconnect all SCSI devices except the integrated SCSI adapter and the drive at SCSI address 0, and try again. If this fails, try substituting a known good SCSI adapter board and a good hard disk drive.

Symptom:

- The SCSI BIOS has trouble loading

If the NetServer has trouble loading the SCSI BIOS, do the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. If you installed more than one SCSI controller, make sure that the BIOS of all SCSI controllers are disabled except for the boot controller. This lets the SCSI BIOS for the boot controller load.
3. Determine what the boot device priority is for the NetServer model. Verify that the boot device is in the right place in the priority.

Symptom:

- The SCSI subsystem does not work at installation

An incorrect configuration and not faulty hardware cause many SCSI problems. If the SCSI subsystem does not work after installation, do the following:

1. Review the **Troubleshooting Checklist** and **Mass Storage Guidelines** before you continue.
2. Run the **DiagTools** and verify the integrity of the SCSI buses, and other switch settings on the external storage devices are correct. Verify that each SCSI device is assigned a unique SCSI ID.
3. If you don't see the SCSI BIOS banner during NetServer start:

   ```
   "Symbios, Inc. SDMS(TM)V4.0 PCI SCSI BIOS, PCI Rev. 2.0, 2.1"
   "Copyright 1995, 1998 Symbios, Inc."
   ```

   - Check the cable connections.
   - Check the SCSI termination.

4. Run the Setup Utility or SCSI Configuration Utility and verify the SCSI host bus adapter (HBA) is properly configured.

   The HBA is usually SCSI ID 7.

5. If you installed more than one SCSI adapter, verify each adapter is set to a separate BIOS address; or disable the BIOS on all of the adapters except one.
6. For each device, verify;

   - The device has a unique SCSI address.
   - In general, when selecting an address for a drive (default address is 0), select as low a SCSI address as possible.
   - The device's jumpers are set according to the device documentation.
   - The hard disk activity light cable (for non-hot-swap devices) is properly installed.

7. Check that the primary SCSI hard disk drive is set to the lowest address (usually set to 0). Each device (the HBA is also a device) must have a unique and separate SCSI ID number. To solve this problem, simply set the device ID to something other than that of the HBAs SCSI ID (7). If the device is a boot drive, then the SCSI ID should be set at 0.
8. If another hard disk drive is connected to the SCSI bus, check it for unique address, SCSI cable connection, and power connection.

9. Check the SCSI bus cable for correct orientation, alignment, and seating on the SCSI adapter and the SCSI device.
10. Check for the correct Hewlett-Packard internal and external SCSI cables.
11. Check that all SCSI devices are connected to power, and power-on all SCSI devices before or at the same time as the NetServer to ensure a stable SCSI bus.
12. Watch the boot screen for all SCSI devices to be displayed. For example, in a NetServer with 1 SCSI controller and 2 hard disk drives (one with ID 0 and one with ID 1), if a valid device is found at device address 0, but not at address 1, you would see these device validation lines on the boot screen:

    ```
    Channel x, SCSI ID #n - id info - Drive C: (80h)
    ```

    If you see this message:

    a. Verify that the SCSI hard disk drive is set to address 1.

    b. Check the SCSI bus cable for correct orientation, alignment, and seating on the host adapter and the hard disk drive.

    c. Verify that terminators are installed at each end of the SCSI bus, but not on any other devices. The hot swap cage printed circuit board has automatic termination that disconnects when a cable is attached.

    d. Verify all SCSI devices on the bus are appropriate for that bus (only single-ended SCSI devices on the single-ended bus; only differential SCSI devices on the differential bus).
13. If the NetServer still fails to recognize the SCSI drive, disconnect all SCSI devices except the host adapter and the drive at SCSI address 0 and try again. If the NetServer fails, try substituting a known good hard disk drive.
14. If the SCSI BIOS has properly identified device 0 and has installed it as drive C, but cannot find a device at address 1, and in addition, if no further messages are displayed, it indicates the NetServer cannot load the operating system from device 0, check the following:

    a. If a second hard disk drive is connected to the SCSI bus, check it for proper address selection, SCSI cable connection, and proper power.

    b. Partition the hard disk drive if required.
15. Use only SCSI devices without built-in terminators.

    The HP NetServer embedded controllers are terminated automatically on the hot swap cage or at the end of the SCSI cable. If you are installing a SCSI device that uses a built-in terminator, you must remove the terminator from the device before proceeding with the installation.

    Use only the HP NetServer SCSI cables for the SCSI hot swap subsystem.
16. Verify all SCSI devices on the bus are appropriate for that bus (only single-ended SCSI devices on the single-ended bus; only differential SCSI devices on the differential bus).
17. Disconnect all SCSI devices except the SCSI adapter and the drive at SCSI address 0, and try again. If this fails, try substituting a known good SCSI adapter and disk drive.
18. Use the Setup Utility to check for resource conflicts, especially if new boards or accessories have been added.

Symptom:

- The SCSI subsystem stops working

If the SCSI subsystem should stop working, do the following:

1. Review the **Troubleshooting Checklist** and **Mass Storage Guidelines** before you continue.
2. Run **DiagTools**. Verify that the SCSI ID and other switch settings are correct and get specific information or verification that the problem is the SCSI bus.
3. If an accessory board was added recently, check if there is a resource conflict between the new board and an existing accessory board. Also, if you have changed the options on an existing board, there may be a resource conflict.
   a. Remove the new board and restart the computer. If this corrects the problem, the board is either defective or it is trying to use a system resource used by the SCSI subsystem.
   b. Check if the board is using memory, I/O addresses, or interrupt lines that are also used by the SCSI subsystem.
4. Check to see if there have been recent changes to any software. For example, has anyone moved, removed, or changed the configuration files or drivers? Refer to the software documentation for more information.
5. If you suspect hardware failure and there are no system error messages, check each component associated with the failure. Equipment failure is probably the most unlikely reason for a SCSI subsystem failure.

Processor Problems

If a problem exists with the NetServer processor;

1. Remove and reseat the processor module(s).
2. Replace each of these components, one-at-a-time, with a known-good component, and retest the NetServer:
   - Processor
   - Terminator (if so equipped)

CAUTION	Do not push on the processor components; push only on the edge. Pushing on the device may damage it.

3. If the fault persists, replace the system board.

Memory Problems

The memory modules are DIMMs.

NOTE	If the **POST** (displayed at power-on time) indicates a defective memory module, replace it.

1. Review the **Troubleshooting Checklist** before you continue.

2. If memory problems are being experienced, power the NetServer off and on. This performs a "cold" restart, rather than a "warm" restart (as it does when you press **Ctrl+Alt+Del**).
3. Check the BIOS event log (available on certain NetServer models) for messages indicating memory errors.
4. Run the **DiagTools** memory test.
5. Reseat the memory modules.
6. To check that the modules are installed and configured correctly:
   a. Run the Setup Utility and check the configuration.
   b. Install one known good DIMM. If you still receive an error, replace the system board.

      If the error goes away, add another DIMM and reboot again. Continue this process until you have installed all DIMMs or you experience a failure.

      Replace the defective DIMM.
7. Once a suspect part has been found, verify the cause of the problem by reinstalling the part and attempting to duplicate the error. Also install it in another memory socket to confirm whether or not the socket is defective.

Network Interface Card Problems

See the appropriate Network Interface Card documentation.

Symptom:

- If the adapter can't connect to the network

1. Make sure the cabling is installed properly.
2. Most hub and switch connections require straight-through cable; consult their documentation. If you're directly connecting two computers (with no hub or other device), use a “crossover” cable.
3. Verify there are no resource conflicts between the NIC and any other accessories in the NetServer. Check the Setup Utility.
4. Check the LEDs on the adapter at the back of the computer to see if any show activity. No lit LEDs probably indicate a bad network cable, hub connection or other network error.
5. Ensure you're using the latest and correct drivers. Verify the drivers are intended for this adapter.
6. Ensure the port on the switch or hub (or other device) has the same duplex setting as the adapter.
7. If you configured the adapter for full duplex, make sure the switch port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.
8. Test the adapter as directed in the installation tasks for each operating system. Also check the “README” files on the support disk.

6 Replacing Parts

Safety Information

Follow the procedures listed below to ensure safe handling of components and to prevent harm to both you and the server:

- Use an anti-static wrist strap and a grounding mat, such as those included in the Electrically Conductive Field Service Grounding Kit (HP 9300-1155).
- Handle accessory boards and components by the edges only. Do not touch any metal-edge connectors or any electrical components on accessory boards.
- Do not wear clothing subject to static charge build-up, such as wool or synthetic materials.

WARNING	Hazardous voltages are present inside the server. Always remove AC power from the CPU and other associated assemblies while working inside the unit. Serious injury may result if this warning is not observed.

Service Tools Required

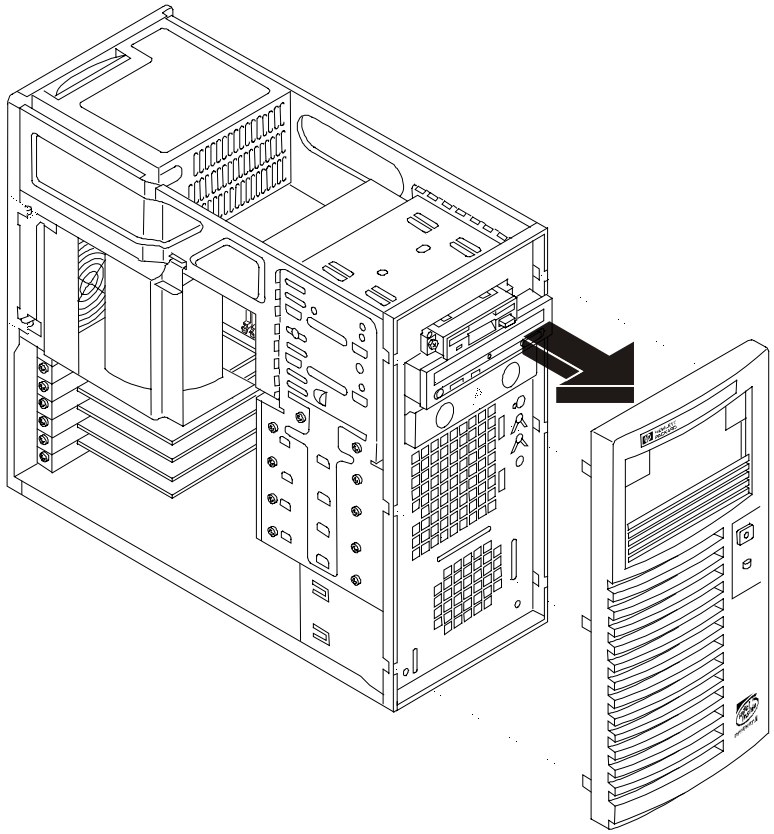
Service of this product may require one or more of the following tools:

- Electrically Conductive Field Service Kit (P/N 9300-1155)
- CE Peripheral Exerciser Disk Kit (45935-63210)
- Datacomm Test Hood, 9-pin (24540-60010)
- Datacomm Test Hood, 25-pin parallel (24540-60011)
- 1/4 inch Flat Blade Screwdriver
- T-15 Torx® Screwdriver

Front Panel Bezel

Removing the Bezel

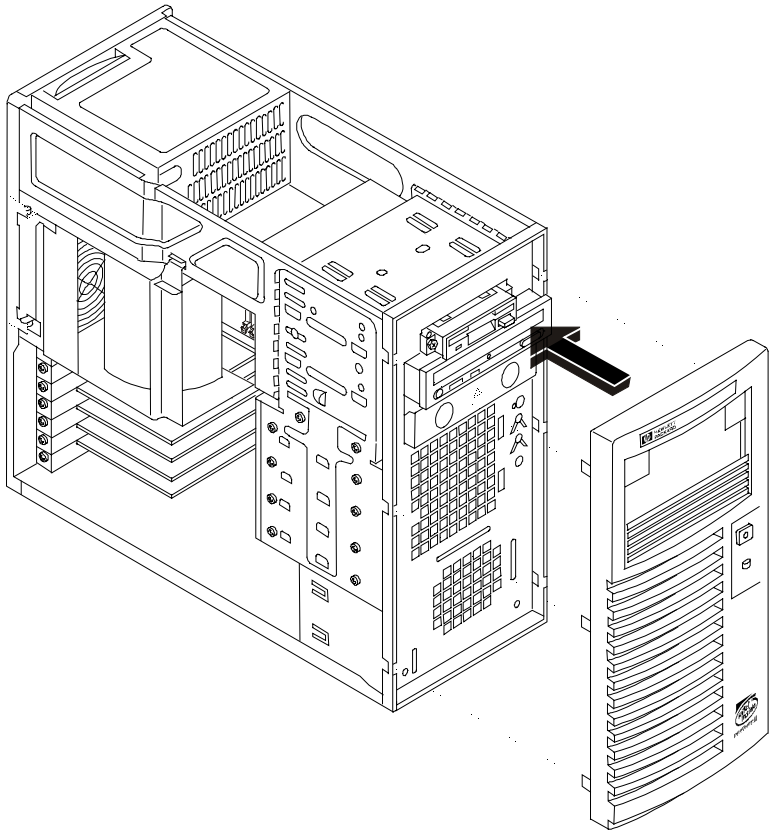
1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Undo the six thumbscrews securing the cover to the chassis.
4. Remove the cover.
5. Where the six bezel tabs are connected to the six slots on the chassis, release the tabs by applying outward pressure on the tabs, gently pull the bezel forward and away from the chassis.



Removing the Bezel

Replacing the Bezel

1. Align the six bezel tabs with the six slots on the chassis, gently press the bezel onto the chassis front until the tabs snap into the slots.
2. Replace the cover.
3. Fasten the six thumbscrews securing the cover to the chassis.
4. Replace the external cables and power cord.
5. Power up the NetServer as described in Chapter 1.

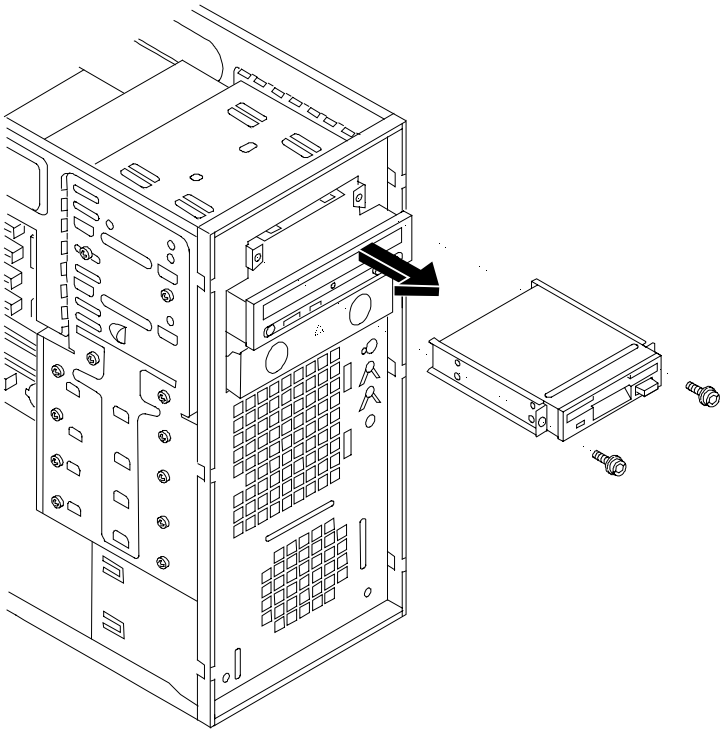


Replacing the Bezel

Flexible Disk Drive

Removing the Flexible Disk Drive

1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Undo the six thumbscrews securing the cover to the chassis.
4. Remove the cover.
5. Remove the bezel.
6. At the rear of the flexible disk drive, carefully disconnect the power and data cables.
7. Remove the two screws securing the flexible disk drive to the chassis.

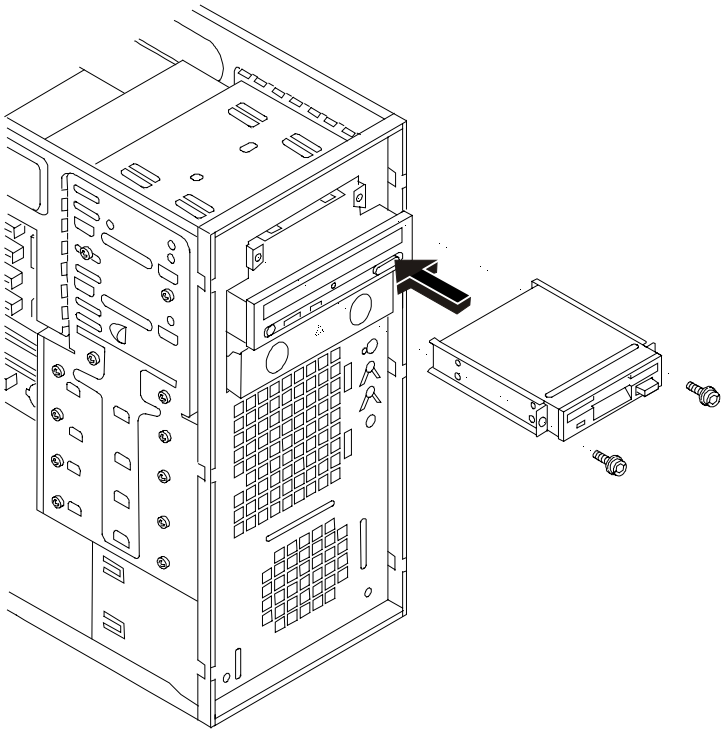


Removing the Flexible Disk Drive

8. Pull the flexible disk drive forward and out of the chassis.
9. Remove the four screws securing the flexible disk drive mounting guides to the flexible disk drive.
10. Remove the flexible disk drive mounting guides from the flexible disk drive and store them for future use.
11. Place the flexible disk drive in an anti-static bag.

Replacing the Flexible Disk Drive

1. If not already mounted, use four screws to install mounting guides on the flexible disk drive.
2. With the cable connectors toward the rear of the chassis, guide the mounted drive into the chassis opening. (The flexible disk drive is normally mounted in the top-most shelf.)
3. Attach the drive and mount by securing the two screws at the chassis front.
4. At the rear of the flexible disk drive, carefully connect the power and data cables.
5. Replace the bezel.
6. Replace the cover.
7. Replace the six thumbscrews securing the cover to the chassis.
8. Replace the external cables and power cord.
9. Power up the NetServer as described in Chapter 1.

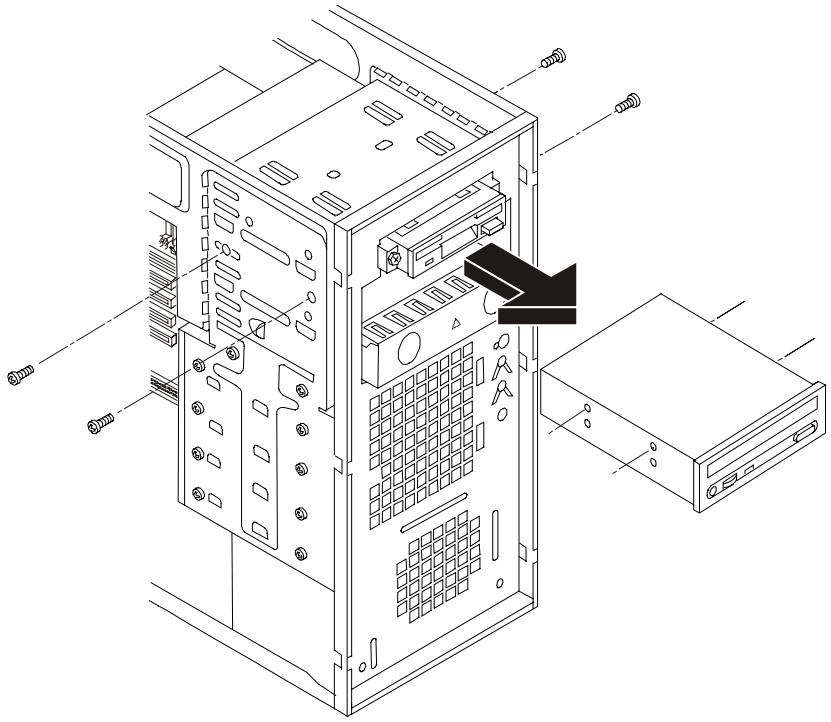


Replacing the Flexible Disk Drive

CD-ROM

Removing the CD-ROM

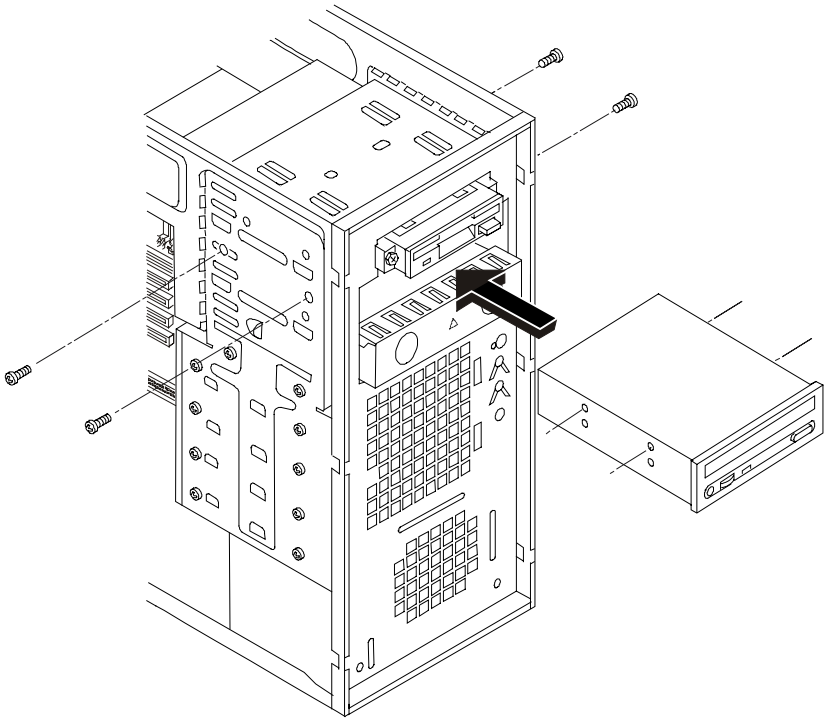
1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Undo the six thumbscrews securing the cover to the chassis.
4. Remove the cover.
5. Remove the bezel.
6. At the rear of the CD-ROM, carefully disconnect the power and data cables.
7. Remove the four screws, located on the chassis sides, securing the CD-ROM to the chassis.
8. Pull the CD-ROM forward and out of the chassis.
9. Place the CD-ROM in an anti-static bag.



Removing the CD-ROM

Replacing the CD-ROM

1. Remove the CD-ROM from the shipping container.
2. Make any settings required by the CD-ROM documentation.
3. With the cable connectors toward the rear of the chassis, guide the CD-ROM into the chassis opening. (The CD-ROM is normally mounted in the second shelf.)
4. Attach the CD-ROM by securing the four screws at the chassis side.
5. At the rear of the CD-ROM, carefully connect the power and data cables.
6. Replace the bezel.
7. Replace the cover.
8. Fasten the six thumbscrews securing the cover to the chassis.
9. Replace the external cables and power cord.
10. Power up the NetServer as described in Chapter 1.

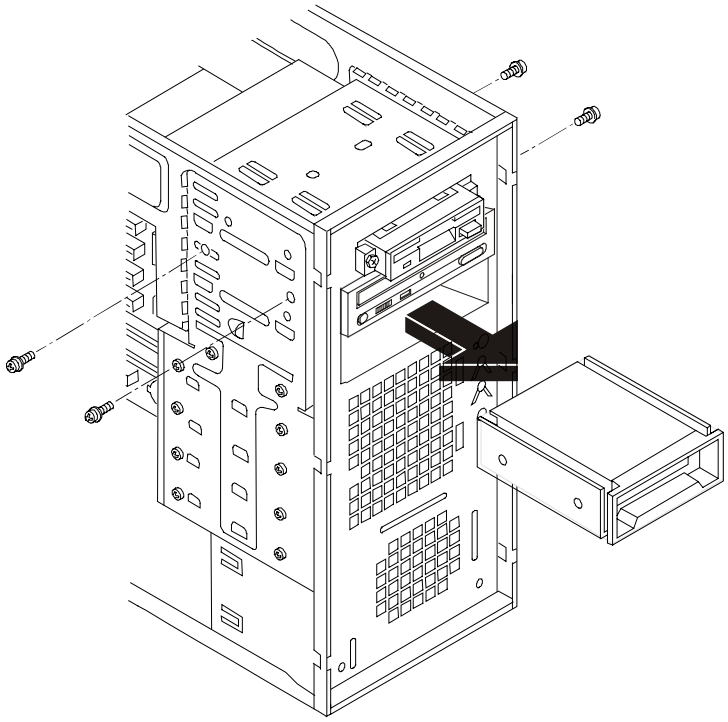


Replacing the CD-ROM

Hard Disk Drive (Shelf Mounted)

Removing a Hard Disk Drive (Shelf Mounted)

1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Undo the six thumbscrews securing the cover to the chassis.
4. Remove the cover.
5. Unsnap the air duct and move it out of the way.
6. At the rear of the hard disk drive, carefully disconnect the power and data cables.
7. Remove the four screws, located on the chassis sides, securing the hard disk drive to the chassis.
8. Pull the hard disk drive forward and out of the chassis.
9. Place the hard disk drive in an anti-static bag.



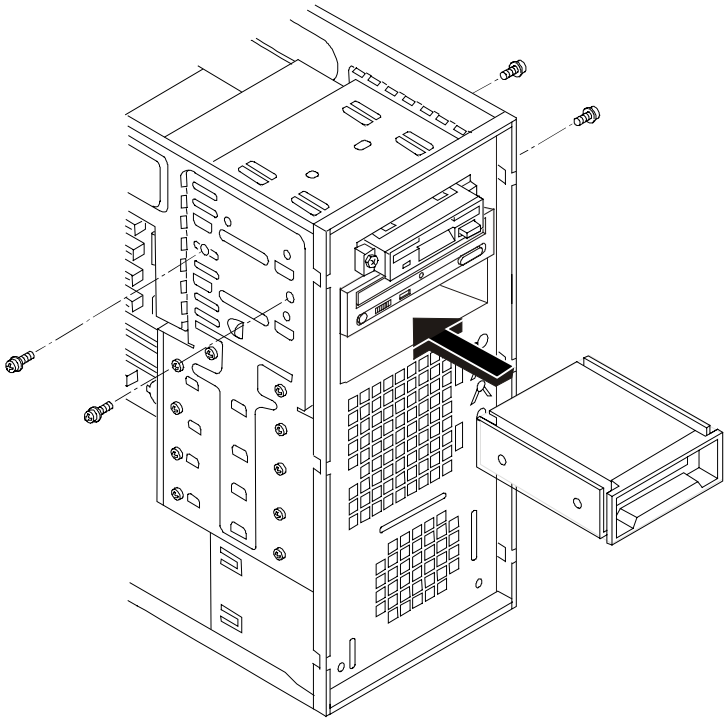
Removing a Hard Disk Drive (DAT shown)

Replacing a Hard Disk Drive (Shelf Mounted)

1. Remove the hard disk drive from the shipping container.
2. Make any settings required by the hard disk drive documentation.
3. With the cable connectors toward the rear of the chassis, guide the hard disk drive into the chassis opening.
4. Attach the hard disk drive by securing the four screws at the chassis side.
5. At the rear of the hard disk drive, carefully connect the power and data cables.
6. Replace the air duct and latch it into the chassis.
7. Replace the bezel.

NOTE	If this is the initial installation of a hard disk drive in this location, it is necessary to remove the bezel drive cover from the front panel bezel.

8. Replace the cover.
9. Fasten the six thumbscrews securing the cover to the chassis.
10. Replace the external cables and power cord.
11. Power up the NetServer as described in Chapter 1.



Replacing a Hard Disk Drive (DAT shown)

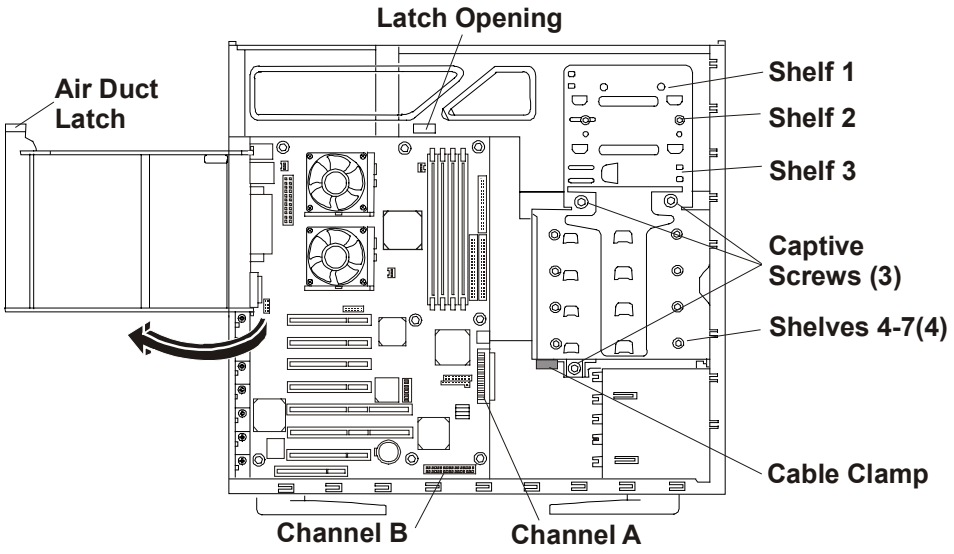
Hard Disk Drive (Cage Mounted)

Removing a Hard Disk Drive (Cage Mounted)

The replacement of the mass storage cage mounted drives is the same for IDE or SCSI drives. The IDE drives require the setting of jumpers on the drives for the master and slave configuration before installing the drives. The SCSI drives are set up during the operation of the SCSI configuration utility.

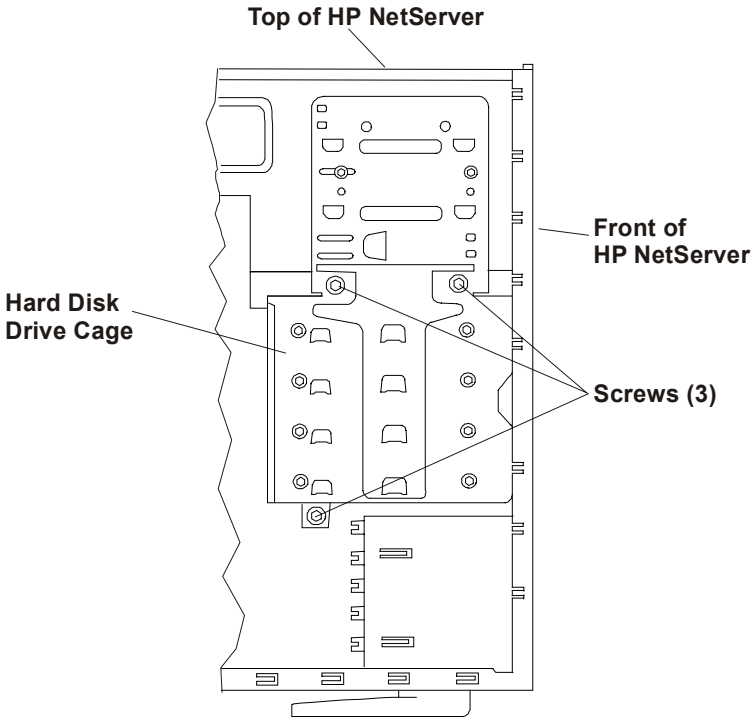
CAUTION	Install and remove connectors carefully, and avoid displacing any pins.

1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover and turn in the NetServer feet (so that the NetServer will lie flat on its side).
4. Lay the NetServer on its side (components showing).
5. Unsnap the air duct and move it out of the way.



Moving the Air Duct

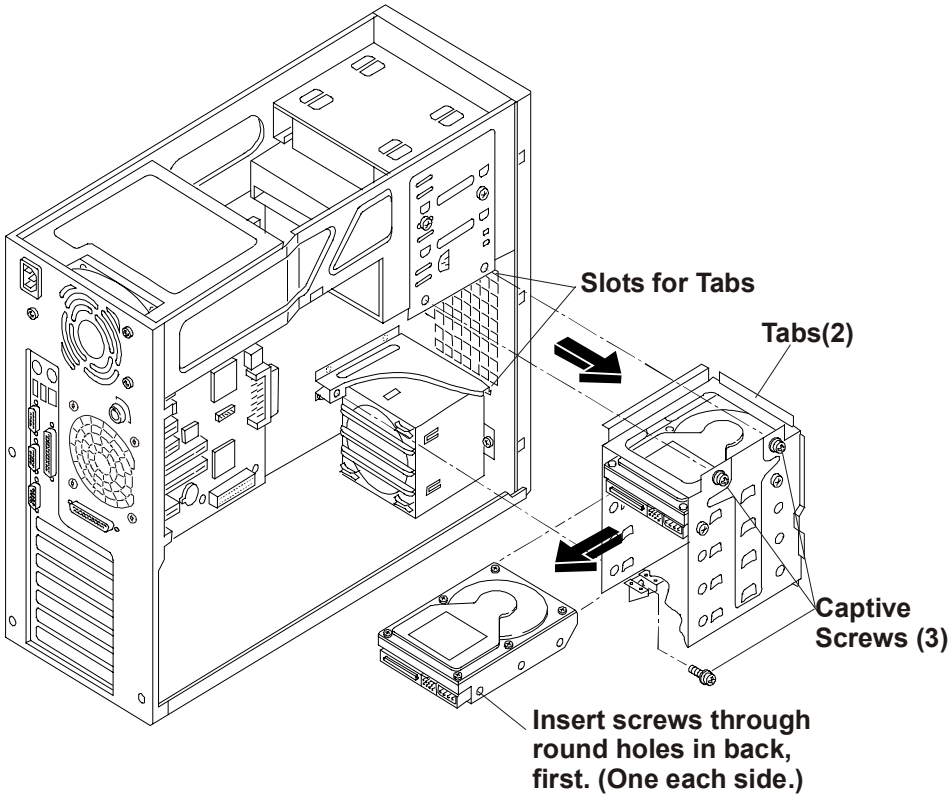
6. Unplug the power and SCSI or IDE cables to any hard disk drives already in the cage.
7. Loosen three captive screws on the mass storage cage.



Side View

Captive Screws Holding the Mass Storage Cage

8. Remove the cage.



Removing the Mass Storage Cage

9. Remove the four screws securing the drive to the mass storage cage. Two screws are located on each side of the cage.
10. Place the removed drive in an anti-static bag for protection.

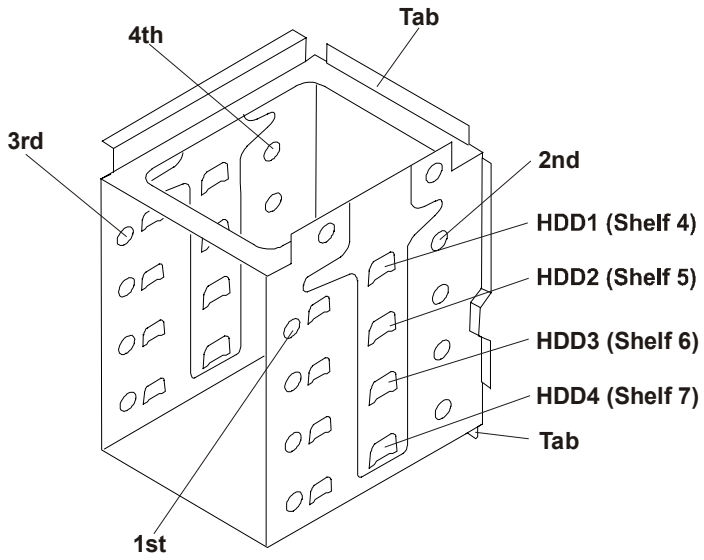
Replacing a Hard Disk Drive (Cage Mounted)

1. If the mass storage cage is already removed from the chassis, perform the following procedure starting at step 2. If it is necessary to remove the mass storage cage from the chassis, perform steps 1 through 9 of the removal procedure.
2. Slide the drive into the cage opening with the cable connectors toward the rear of the NetServer.

   Align the screw holes on the drive with the screw holes in the mass storage cage.

NOTE	If the hard disk drive you are planning to install already has a mounting tray attached, you must remove it before you can install the drive in your HP NetServer E 800 mass storage cage.

3.Install the four screws to secure the drive to the mass storage cage.



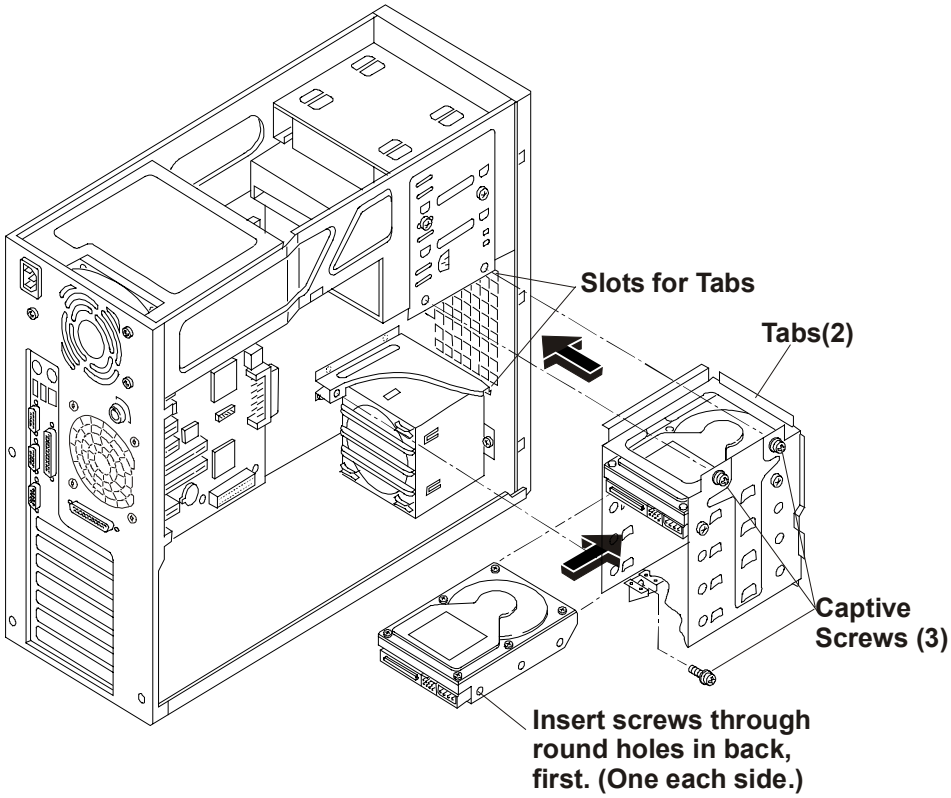
Mass Storage Cage Screw Holes

CAUTION	All mounting screws used with the hard disk drive must be #6-32 and not exceed ¼-inch in length. Longer screws may cause internal damage to the mass storage device. Damage caused by incorrect mounting screws is not covered by the HP warranty.

a. Attach one of the screws through the round screw hole at the rear of the cage, then through the elongated hole at the front of the cage.

b. Repeat on the other side of the cage.

4. Reinstall the mass storage cage.



Installing the Mass Storage Cage

Ensure the tabs at the front on the cage slide into the slots provided.

5. Connect the cables to the disk drive.

   There are 2 connectors on each IDE cable. The primary cable is intended for the IDE CD-ROM in the mass storage cage.

6. Connect the power cable to the drive.

   The power cable is split into two cables, each with three power connectors. The designed distribution is:

   One string of three (PS-1 through PS-3): CD-ROM, optional tape drive, and shelf-mounted hard disk drive.

   Second string of three (PS-4 through PS-6): three cage-mounted hard disk drives.

   If a power connector has no mate, for example, no optional tape drive installed, leave it unconnected and use connector designed for the device you are connecting.

7. Replace the air duct and latch it into the chassis.
8. Replace the NetServer cover, external cables, and power cord.
9. Power up the NetServer as described in Chapter 1.

Chassis Fan

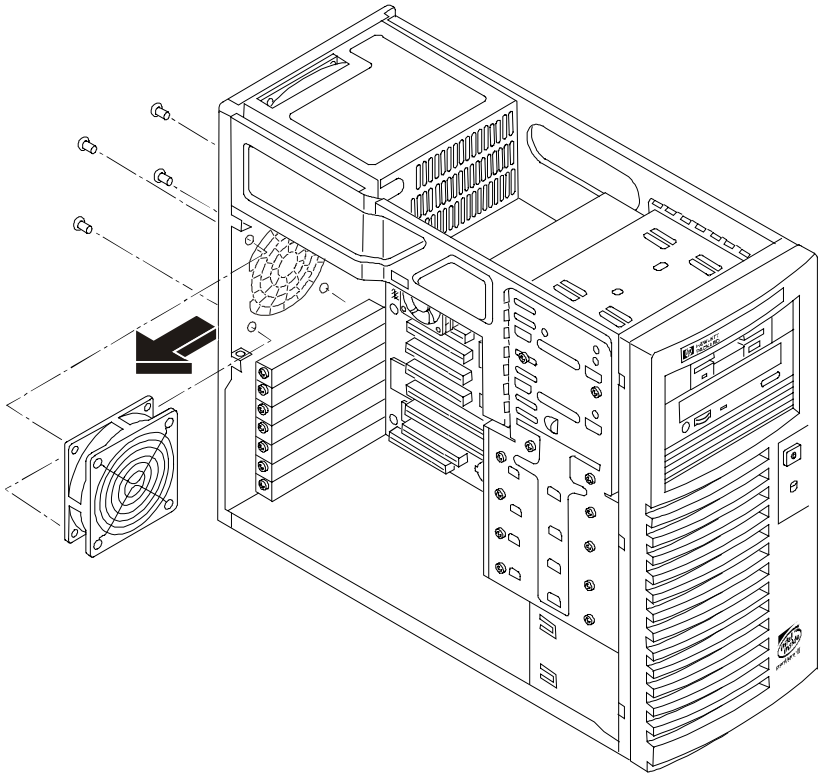
Removing the Chassis Fan

The chassis fan is mounted at the rear of the chassis.

WARNING	Before removing the cover(s), always disconnect the power cords and unplug telephone cables. Disconnect the power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects, such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Note that the power switch does not turn off the standby power. Disconnect the power cords to turn off standby power.

Follow these instructions to remove and replace the chassis fan:

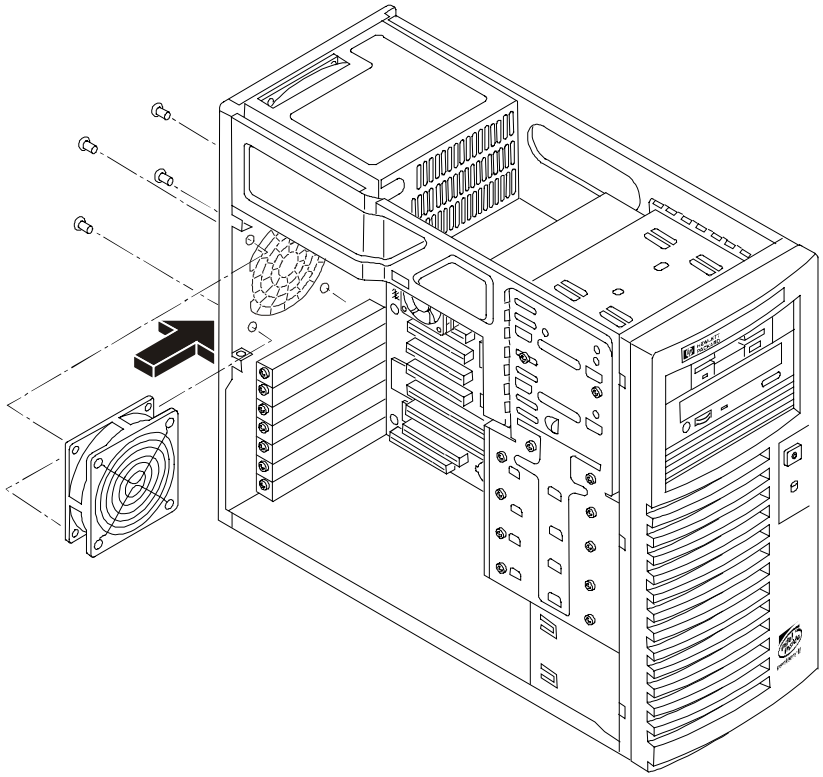
1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover and turn in the NetServer feet (so that the NetServer will lie flat on its side).
4. Lay the NetServer on its side (components showing).
5. Unsnap the air duct and move it out of the way.
6. If necessary, remove any accessory boards from the system board allowing clear access to the fan mounting snaps.
7. Remove the fan by snapping out the four mounting snaps, disconnect the power connector from the system board and lift the fan out and away from the chassis.



Removing the Chassis Fan

Replacing the Chassis Fan

1. Remove the replacement chassis fan from the shipping container.
2. With the power connector toward the rear of the chassis, guide the chassis fan into the chassis opening.
3. Attach the chassis fan by snapping in the four snaps.
4. Connect the power connector.
5. If necessary, replace any accessory boards removed to allow clear access to the fan.
6. Replace the air duct and latch it into the chassis.
7. Replace the cover.
8. Fasten the six thumbscrews securing the cover to the chassis.
9. Replace the external cables and power cord.
10. Power up the NetServer as described in Chapter 1.



Replacing the Chassis Fan

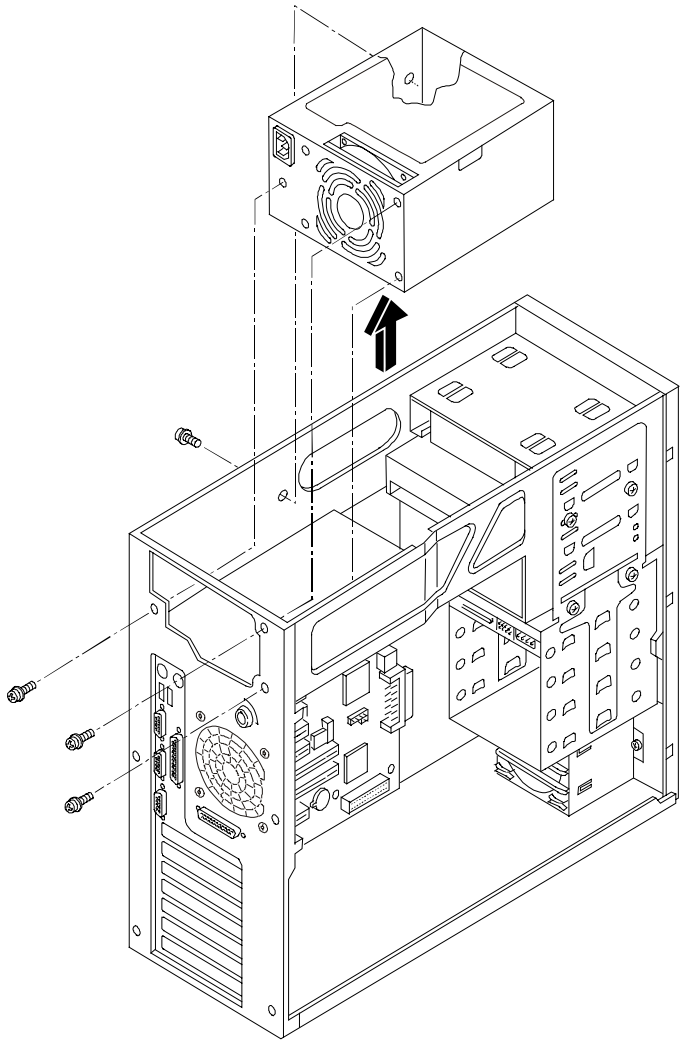
Power Supply

Removing Power Supply

The low voltage ON/OFF switch on the front panel controls the power supply.

To replace the power supply:

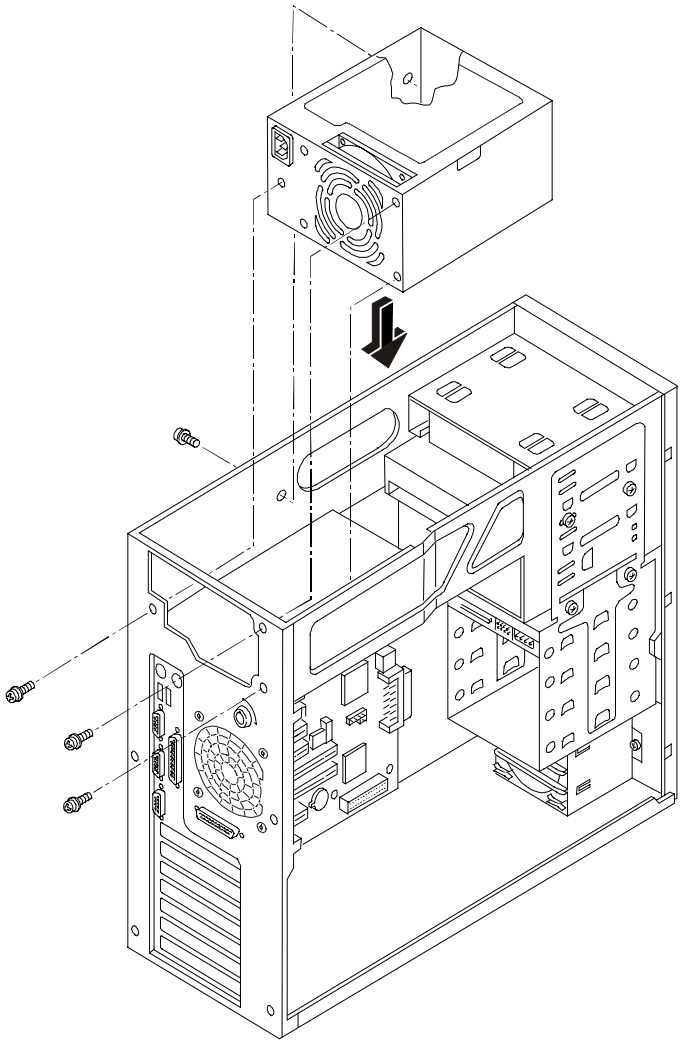
1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover.
4. Remove the four screws securing the power supply to the chassis. Three are located at the rear of the chassis and the fourth is located on the right side.
5. Disconnect the four power cables from the chassis connectors and the FDD.
6. Remove the power supply.



Removing the Power Supply

Replacing the Power Supply

1. Place the new power supply into the chassis.
2. Connect the four power cables to the chassis connectors and the FDD.
3. Replace the four screws securing the power supply to the chassis.
4. Replace the cover.
5. Fasten the six thumbscrews securing the cover to the chassis.
6. Replace the external cables and power cord.
7. Power up the NetServer as described in Chapter 1.



Replacing the Power Supply

Battery

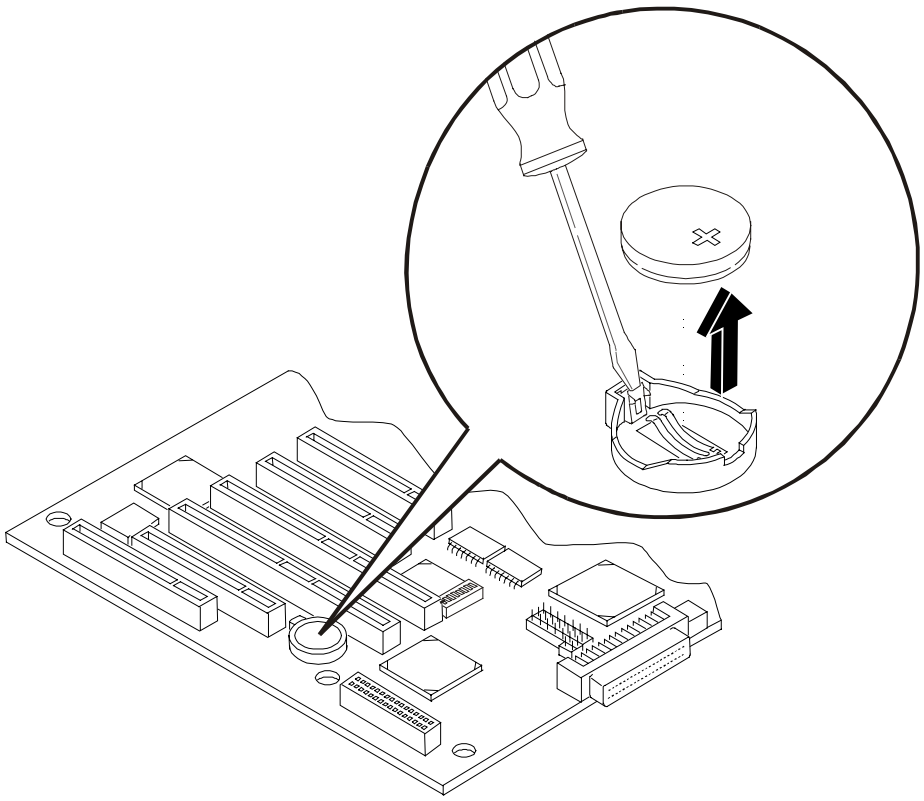
Removing the Battery

1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover and turn in the NetServer feet (so that the NetServer will lie flat on its side).

WARNING	The power supply will continue to provide standby current to the HP NetServer until the power cord is disconnected.

4. Lay the NetServer on its side (components showing).
5. Unsnap the air duct and move it out of the way.
6. Remove any accessory boards, if necessary, allowing access to the battery socket.

7. Remove the existing battery. (The battery is spring loaded into the mounting socket and held in place by a latching mechanism. Press the release mechanism toward the outside of the mounting socket to release the battery.)



Battery Location on the System Board

Replacing the Battery

1. Insert the new battery with the positive sign (+) facing out, and ensure that it is seated completely. Ensure the retaining latch is in place, and holds the battery firmly.
2. If necessary, replace any accessory boards removed to allow access to the battery socket.
3. Replace the cooling duct/cover.
4. Replace the cover.
5. Fasten the six thumbscrews securing the cover to the chassis.
6. Replace the external cables and power cord.
7. Power up the NetServer as described in Chapter 1.

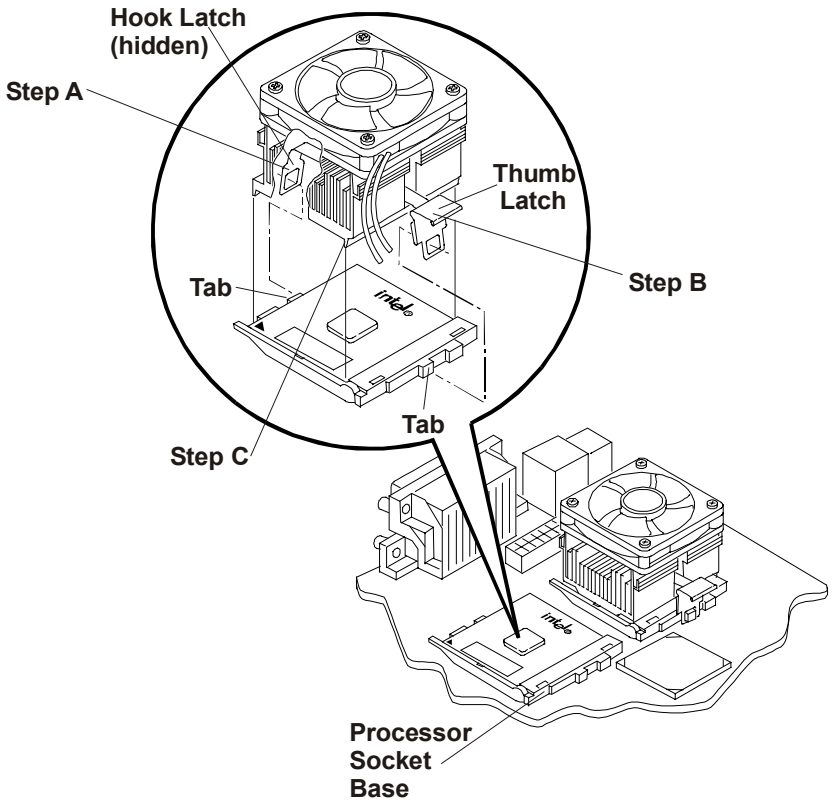
Processor

Removing the Processor

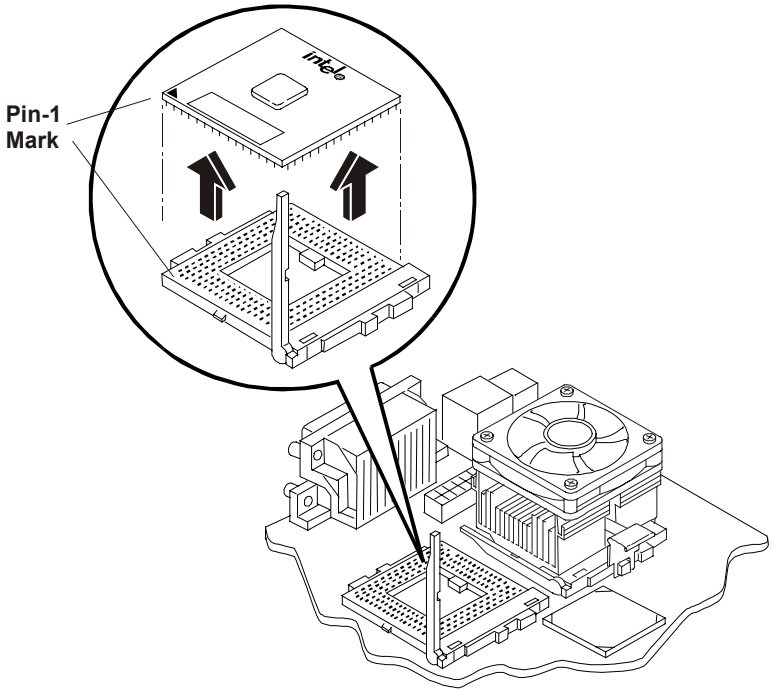
1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover and turn in the NetServer feet (so that the NetServer will lie flat on its side).

WARNING	The power supply will continue to provide standby current to the HP NetServer until the power cord is disconnected.

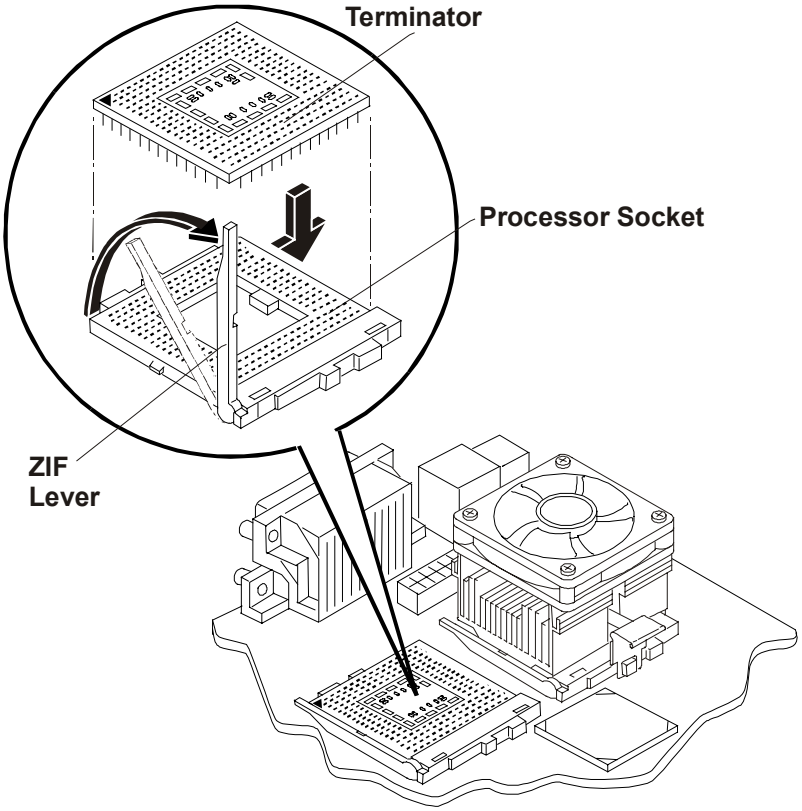
4. Lay the NetServer on its side (components showing).
5. Unsnap the air duct and move it out of the way.
6. Disconnect the cooling fan power cable from the connector on the system board.
7. Unhook the thumb latch on the heatsink and lift the heatsink up slightly from the processor.



8. Rotate the heatsink away from the processor toward the rear of the NetServer, releasing the hook latch.
9. Lift the heatsink away from the processor and out of the NetServer.
10. Open the ZIF lever to allow removal of the processor.



11. Grasp the processor by its edges and lift it out of the socket and place it on a static-dissipating work surface or into an anti-static bag.
12. If you are not replacing the processor with a new or replacement processor, you must install the terminator in the empty processor socket.



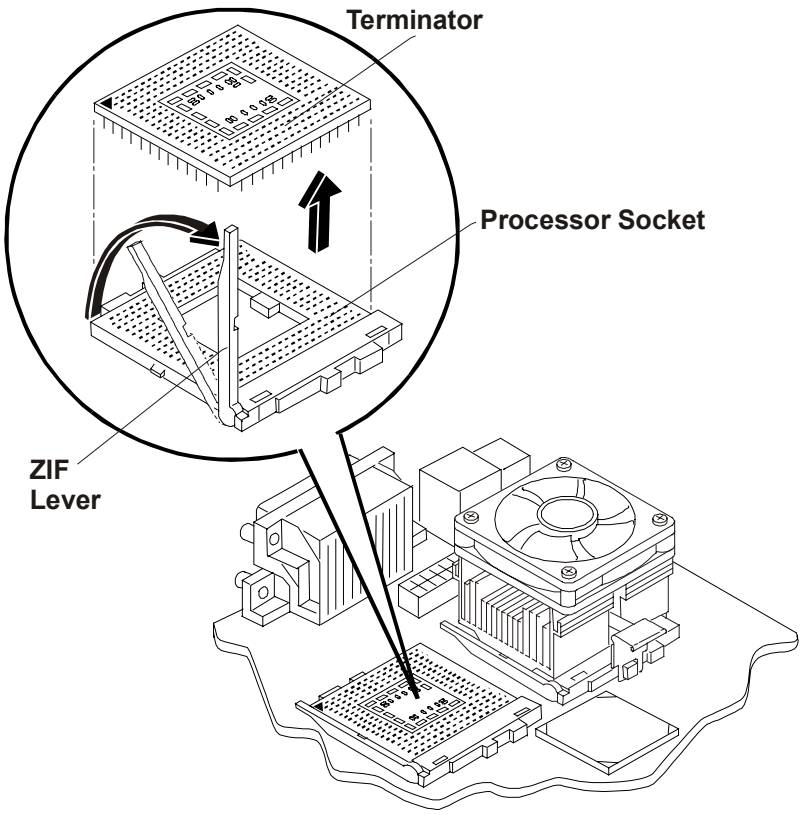
Replacing the Processor

1. Ensure the processor speed of the second processor (CPU 2) is the same as the existing processor before installing the second processor.

NOTE If you are upgrading the second processor to a faster processor speed than the primary processor, the primary processor must also be changed. Both processors must have the same product number, which includes the same clock speed, cache size, and FSB speed.
The supported processors only perform at the rated speed indicated on the processor in the HP NetServer.

2. Open the ZIF (Zero Insertion Force) lever to allow removal of the terminator installed in the processor socket.

   You need to pull the lever out away from the ZIF socket and then raise it to a full 90° to the system board.



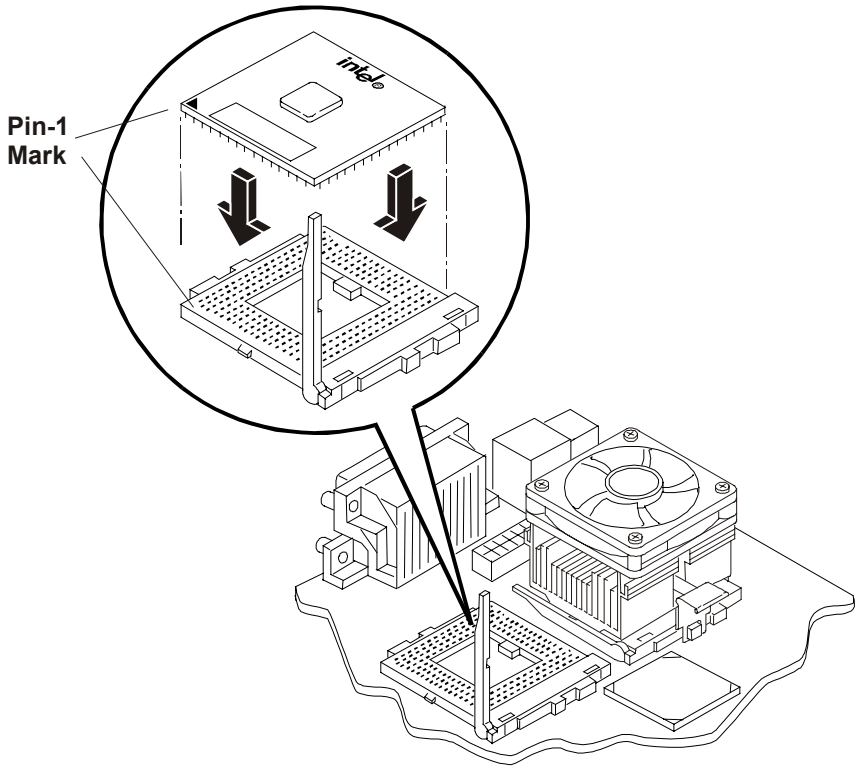
NOTE Retain the terminator for future use. The NetServer will not operate properly if using only one processor with no terminator installed.

3. Lift the terminator out of the socket and place it on anti-static surface or container.
4. Align the second processor over the empty processor socket.

The socket has a mark for pin-1 that should match the mark for pin-1 on the processor near the end of the ZIF lever.

CAUTION	Ensure you align pin-1 of the processor with pin-1 of the processor socket or pin damage will occur.

5. Insert the second processor into the socket and close the ZIF lever to fully seat the processor.



You should hear the ZIF lever click when it closes properly.

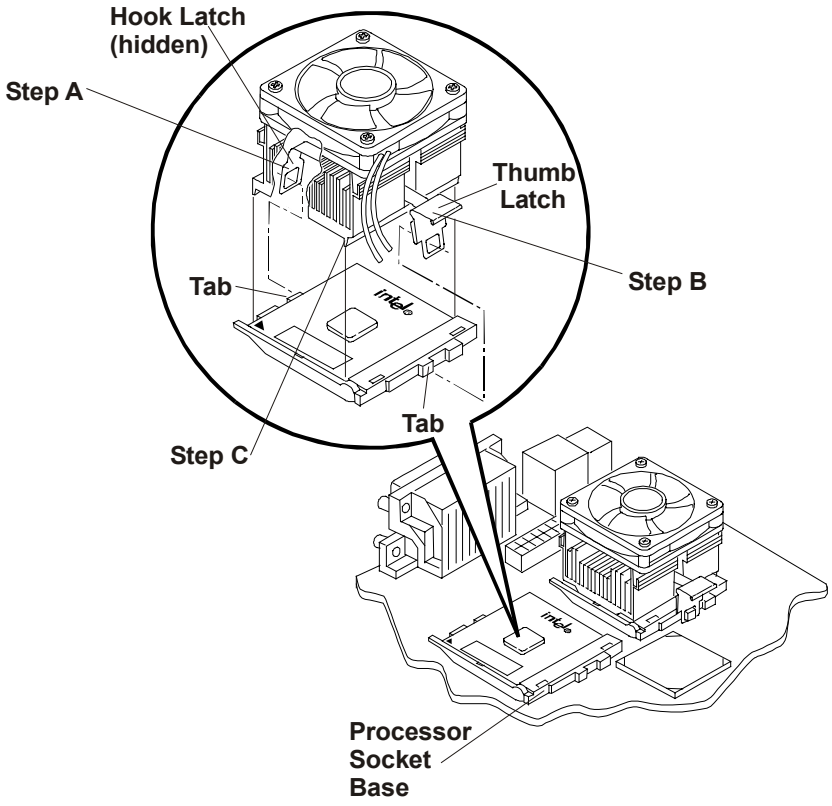
Installing the Cooling Fan-Heatsink

Once the processor is installed, the cooling fan-heatsink must be installed on top of the processor. Each processor requires a heatsink, with its cooling fan attached, and a thermal bonding between the processor and the heatsink, provided with the white thermal patch. The heatsink is mechanically connected to the processor socket with both latches, mechanically making contact with processor.

1. Remove the heatsink-fan assembly from the shipping container and ensure you do not touch the thermal patch on the bottom of the heatsink.
2. Ensure the latches are free and pointing away from the heatsink.
3. Position the heatsink over the second processor and:
   a. Tilt or roll it slightly to the rear of the chassis to help engage the hook latch and then connect the hook latch to the tab.
   b. Rotate the heatsink back, placing it squarely on top of the processor and connect the thumb latch to the tab on the base of the processor socket.

      The hook latch and thumb latch both hook underneath the tabs extending from the base of the processor socket base.

c. Ensure the ridge on the bottom of the heatsink rest between the processor and the edge of the processor socket base.



CAUTION	Ensure you have made good contact with the processor to avoid thermal overheating. If you have not made good contact with the processor, it will overheat within 20 seconds of power on and will shut down, possibly causing damage to the processor.

4. Connect the heatsink's cooling fan cable to the 2nd cooling fan connector (CPU 2 Fan) on the system board.

CAUTION	Failure to connect the cooling fan to its power connector will cause the NetServer to shut down with no messages displayed and possible damage the processor.

5. Replace the cooling duct/cover and the NetServer cover.
6. Fasten the six thumbscrews securing the cover to the chassis.
7. Replace the external cables and power cord.
8. Power up the NetServer as described in Chapter 1.

DIMMs

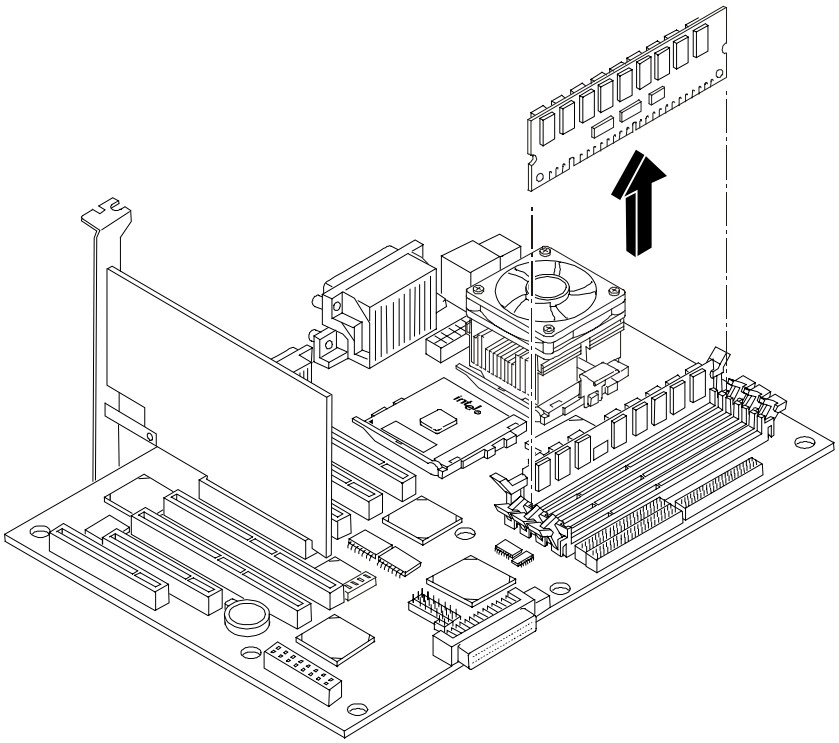
Removing DIMMs

You may need to remove a DIMM module to increase your memory configuration or to replace a defective DIMM.

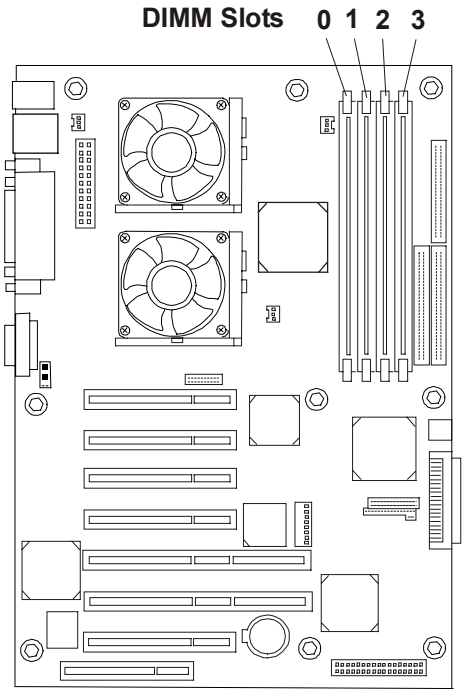
1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover and turn in the NetServer feet (so that the NetServer will lie flat on its side).

WARNING	The power supply will continue to provide standby current to the HP NetServer until the power cord is disconnected.

4. Lay the NetServer on its side (components showing).
5. Unsnap the air duct and move it out of the way.
6. Open the retaining latches.
7. Lift the DIMM completely away from the slot.



8. Place the DIMM in its anti-static container.
9. Repeat steps 6-8 for as many DIMMs as you need to remove.



DIMM Locations on System Board

Replacing DIMMs

1. To install the DIMMs in the desired slot:

   a. Choose a DIMM slot for the desired DIMM.

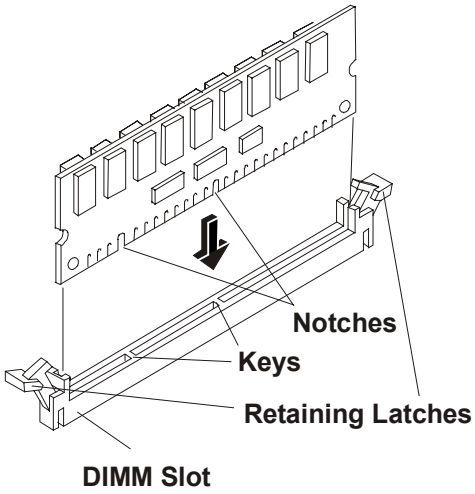
      DIMMs may be installed in any combination, in any slot.

   b. Spread the two retaining latches on the slot outward.

CAUTION	Use only HP DIMMs, which are 3.3V, 133 MHz (PC133), and buffered SDRAM DIMMs. HP's warranty does not apply to non-HP parts.

   c. Remove a DIMM from its protective container, handling the module by its edges. If necessary, lay it on an anti-static surface.

   d. Align the notches on the DIMM with the keys on the slot.



DIMM to Slot Alignment

e. Holding the DIMM at 90 degrees to the system board, press the DIMM fully into the slot until the retaining latches close.

f. If the latches do not close, the DIMM is not inserted correctly.

2. Repeat all of Step 1, to install the additional DIMMs for your memory configuration.
3. Replace the air duct and latch it into the chassis.
4. Replace the cover.
5. Fasten the six thumbscrews securing the cover to the chassis.
6. Replace the external cables and power cord.
7. Power up the NetServer as described in Chapter 1.

NOTE	Most DIMMs are dimensionally identical, so, if you have two or more DIMMs installed, you may verify all DIMMs are seated by sliding a straight edge (a pen, for example) across the top edges and verify it remains in continuous contact with all of the DIMMs.

8. If the DIMMs are not seated properly you may get a blank screen.

Accessory Boards

Removing Accessory Boards

To remove an accessory board, refer to the following procedure

1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover and turn in the NetServer feet (so that the NetServer will lie flat on its side).

WARNING	The power supply will continue to provide standby current to the NetServer E 800 until the power cord is disconnected.

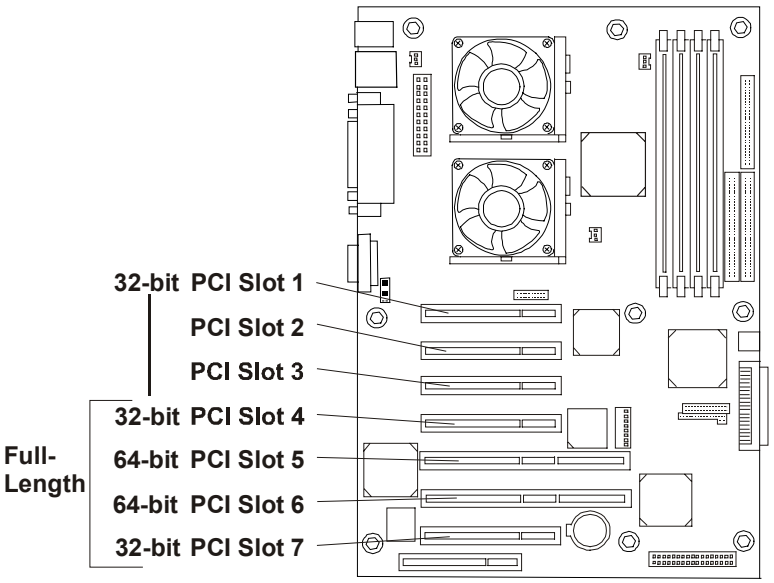
CAUTION	Wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist-strap contacts your skin.

4. Lay the NetServer on its side with the system board facing up (component side up).
5. Unsnap the air duct and move it out of the way.
6. Remove any cables attached to the accessory board. If necessary, label each one to expedite re-assembly of a replacement board.
7. Lift the accessory board up and away from the slot.
8. Place the accessory board and any cables in an anti-static container.

Replacing Accessory Boards

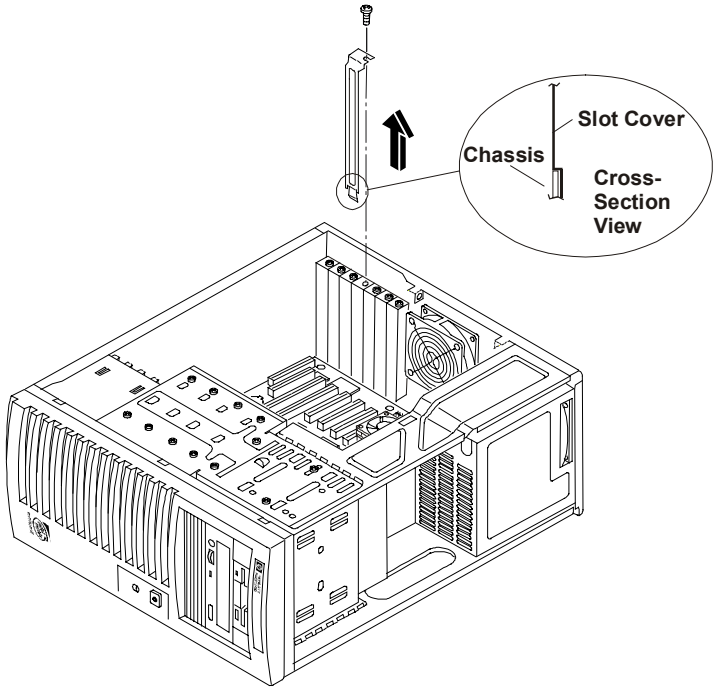
1. Read the documentation included with the accessory board and follow any special instructions. PCI boards must be set to INT A on the board if jumpers are provided.
2. If the accessory board is a new installation proceed with steps 3 through 7. If the accessory board is a replacement proceed with step 8.
3. Identify the accessory slot number to be used.

System Board (Top View)



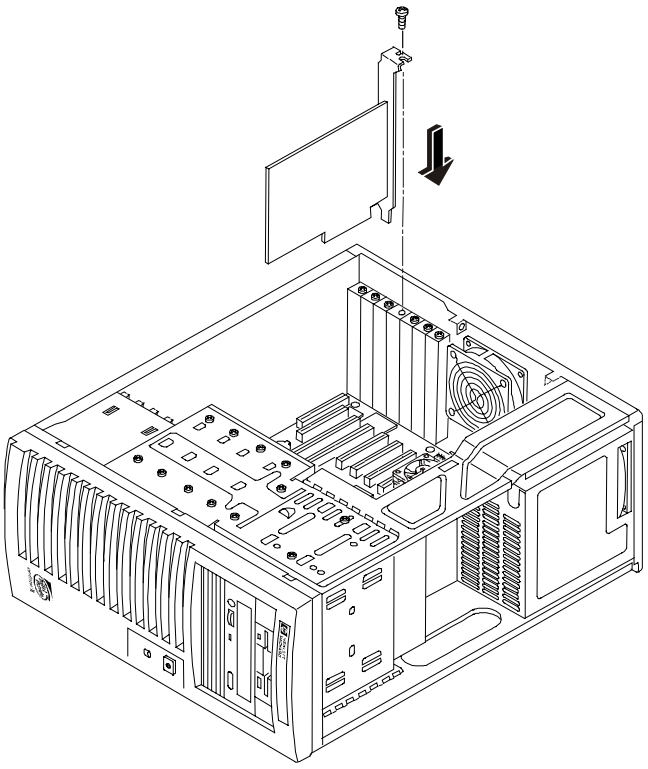
Accessory Slots

4. Use the T-15 driver or flat blade screwdriver to remove the PCI slot cover for each slot to be used, and store for future use.



Removing the Accessory Slot Cover

5. Slide the accessory board into the slot.



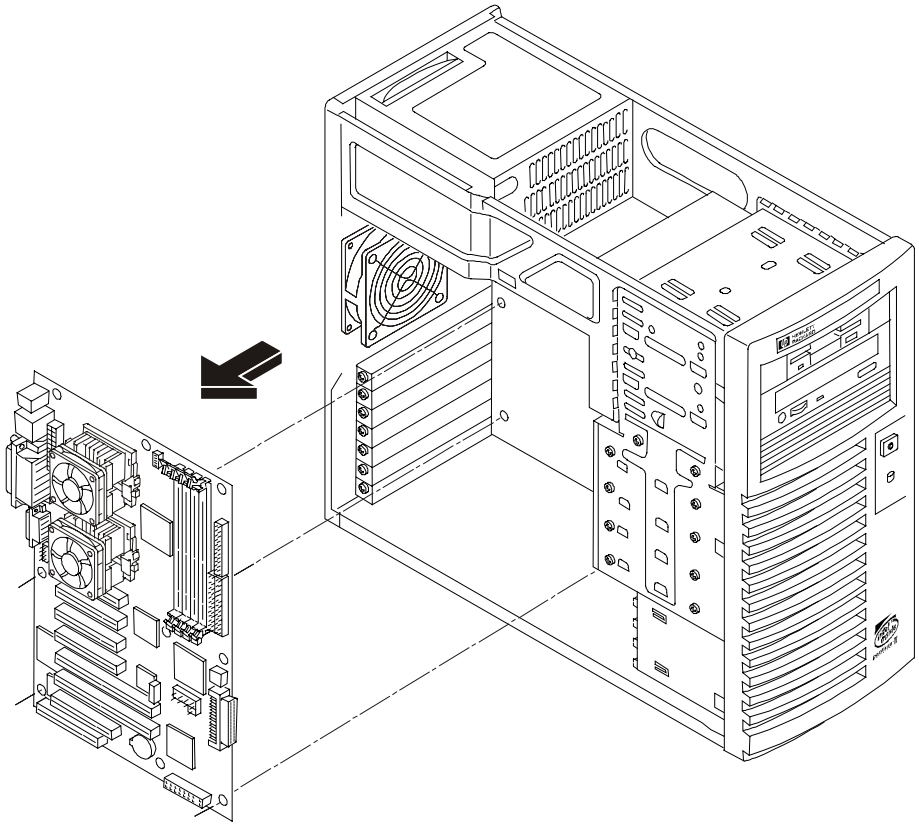
Inserting an Accessory Board

6. Secure the accessory board using the screw you previously removed with the slot cover. Use the T-15 driver or flat blade screwdriver.
7. Once the accessory board is installed, you may need to install software drivers.
   The drivers for the new board are either part of your existing NetServer software or included on a flexible diskette included with the accessory board.
8. Slide the accessory board into the slot.
9. Secure the accessory board using the screw you previously removed with the slot cover. Use the T-15 driver or flat blade screwdriver.
10. Replace the air duct and latch it into the chassis.
11. Replace the cover.
12. Fasten the six thumbscrews securing the cover to the chassis.
13. Replace the external cables and power cord.
14. Power up the NetServer as described in Chapter 1.
15. Once the accessory board is installed, you may need to update software drivers.

System Board

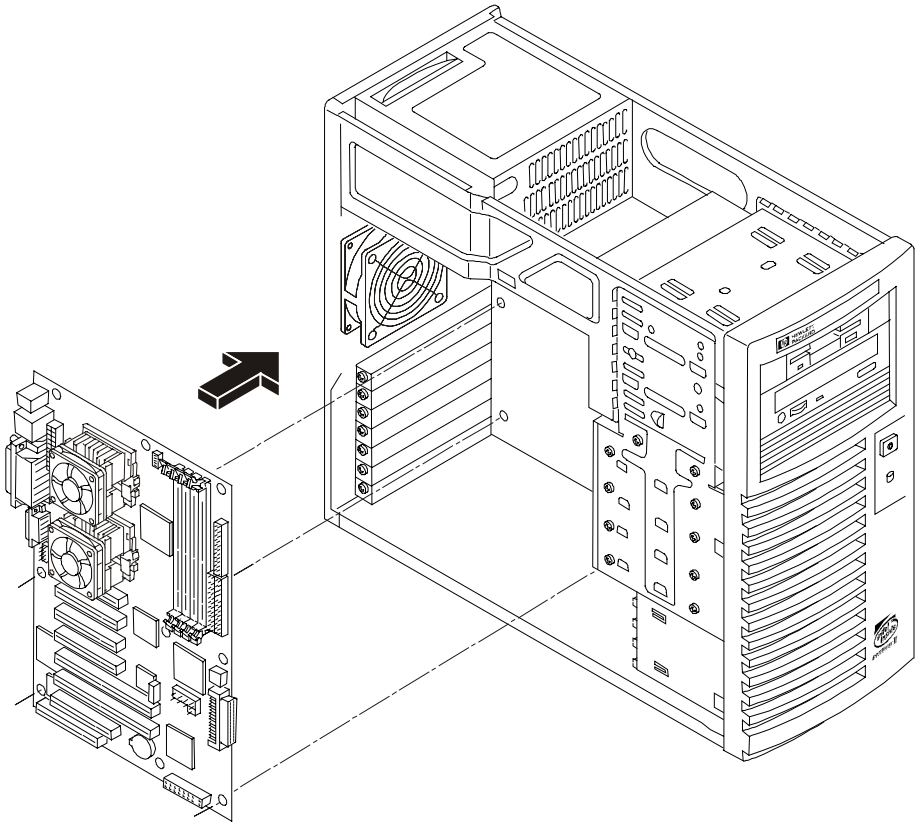
Removing the System Board

1. If the NetServer is operating, power down the NetServer.
2. Disconnect the power cord and any external cables connected to the NetServer. If necessary, label each one to expedite re-assembly.
3. Remove the cover and turn in the NetServer feet (so that the NetServer will lie flat on its side).
4. Lay the NetServer on its side (components showing).
5. Unsnap the air duct and move it out of the way.
6. Remove any accessory boards mounted on the system board.
7. Remove all cables connected to the system board. If necessary, label each one to expedite re-assembly.
8. Remove the seven screws securing the system board to the chassis.
9. Slide the system board forward, releasing the rear panel connectors, then lift the system board up and away from the chassis.
10. Place the system board on an anti-static pad and record all jumper connections and settings.
11. Remove memory, processor(s) and/or CPU terminator. Place components on an anti-static pad.
12. Place the system board and any cables in an anti-static container.



Replacing the System Board

1. Remove the replacement system board and any cables from the anti-static shipping container.
2. Place the system board on an anti-static pad and set all jumper connections and settings as recorded during the system board removal.
3. Place the system board in the chassis aligning the rear panel connectors to the rear chassis and the mounting holes in the board with the holes in the chassis.
4. Install the seven screws securing the system board to the chassis.
5. Replace memory, processor(s) and/or CPU terminator.
6. Replace all cables that were removed during removal.
7. Replace any removed accessory boards.
8. Close the air duct.
9. Replace the cover and turn out the NetServer feet.
10. Stand up the NetServer.
11. Connect the power cord and any external cables to the NetServer.



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